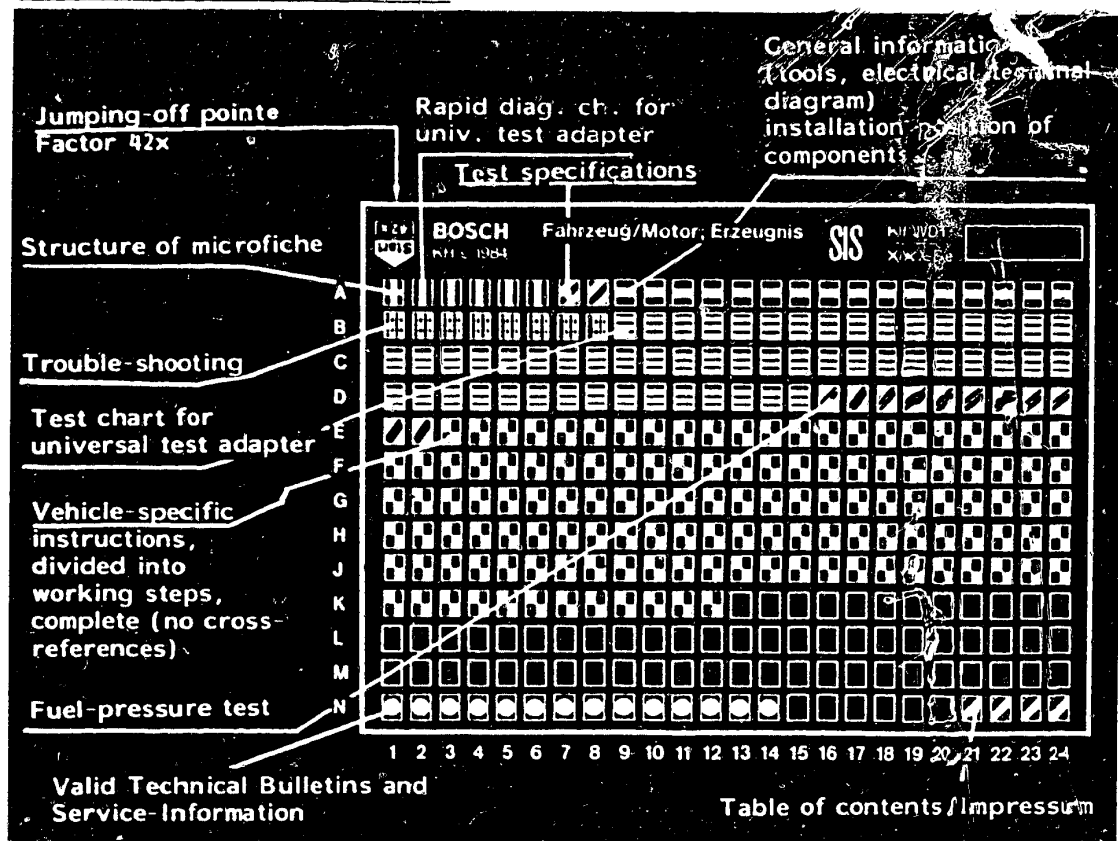


Structure of microfiche

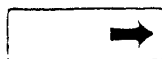


1. Read from left to right
2. Title of microfiche (appears on each coordinate)

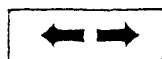
E16	Product/component/test step
	Vehicle, engine

↑ Coordinate

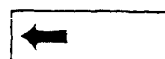
3. Limits of section



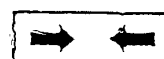
Beginning



Mid-section



End



One-page section

4. Purely vehicle-specific passages in the text are marked with a vertical bar.

5. Reference to relevant working steps in the test specifications, e.g. coordinate C6.

C6

A1

Trouble-shooting program



RAPID DIAGNOSIS CHART FOR UNIVERSAL TEST ADAPTER

The following rapid diagnosis chart makes it possible for the experienced L-Jetronic expert to quickly check the electrical part of the system using the universal test adapter.

The rapid diagnosis chart contains the following information:

- Switch positions on the universal test adapter
- Sequence of test steps
- Notes on how to operate the universal test adapter or other components
- Readings on the multimeter
- References to coordinates of the relevant detailed testing and trouble-shooting program.

If detailed information and instructions are necessary, always proceed according to the trouble-shooting program starting on Coordinate B1/B2.



Rapid diagnosis chart for universal test adapter

Test step	Switch position		Remarks	Test specifications (Reading)	See following coordinates for trouble-shooting
	V	Ω			
1	3	-	Shift gear to neutral. Operate starting motor. Measure voltage.	8 ... 15V	B 11
2	4	-	Shift gear to neutral. Operate starting motor. Measure voltage.	8 ... 15V	B 15
3	5	-	Shift gear to neutral. Operate starting motor. Measure voltage pulses with motortester.	Ignition pulses	B 19
4	6	-	Ignition "ON". Measure voltage.	8 ... 15V	B 21
5	7	-	Ignition "ON". Measure voltage.	8 ... 15V	B 23
6	8	-	Ignition "ON". Measure voltage.	8 ... 15V	C 3
7	9	-	Ignition "ON". Measure voltage.	8 ... 15V	C 7
8	10	-	Ignition "ON". Measure voltage.	8 ... 15V	C 11
9	11	-	Ignition "ON". Measure voltage. Deflect air-flow sensor flap as far as it will go.	8 ... 15V	C 15
10	12	-	Ignition "ON". Measure voltage.	8 ... 15V	C 19

A3

Rapid diag. chart for univ. test adapter
Lancia Beta, Trevi, HPE, Coupé












A4

Rapid diag. chart for univ. test adapter
Lancia Beta, Trevi, HPE, Coupé



Rapid diagnosis chart for universal test adapter

<u>Test step</u>	<u>Switch position</u>		<u>Remarks</u>	<u>Test specifications (Reading)</u>	<u>See following coordinates for trouble-shooting</u>
	V	0			
11		6	Measure resistance. Deflect flap in air-flow sensor to stop.	<u>80 ... 600 Ω</u>	C 21
12		7	Measure resistance	<u>260 ... 520 Ω</u>	C 23
13		8	Measure resistance	<u>400 ... 800 Ω</u>	D 1
14		9	Measure resistance. Accelerator in rest position	<u>0 ... 10 Ω</u>	D 3
15		10	Depress accelerator fully (full-load position). Measure resistance.	<u>0 ... 10 Ω</u>	D 5
16		11	Measure resistance	<u>30 Ω ... 30 kΩ</u> (depends on temperature)	D 7
17		12	Measure resistance	<u>30 Ω ... 30 kΩ</u> (depends on temperature)	D 9
18		13	Measure resistance	<u>0 ... 10 Ω</u>	D 11
19		14	Measure resistance	<u>0 ... 10 Ω</u>	D 13

A5

Rapid diag. chart for univ. test adapter
Lancia Beta, Trevi, HPE, Coupé



A6

Rapid diag. chart for univ. test adapter
Lancia Beta, Trevi, HPE, Coupé



TEST SPECIFICATIONS

• Air-flow sensor

Measure resistance between term. 7 and term. 8

(with air-flow sensor flap defelected): 200 ... 1000 Ω

B5

• Relay set

Resistance measurement between term. 86b (positive pole of ohmmeter) and term. 85

Relay set 0 332 514 121/
..127:

70 ... 500 Ω

• Auxiliary-air device:

35 ... 70 Ω

• Idle speed

Manually shifted and automatic transmission:
(Shift to driving position "N" in automatic transmission)

900...1000 min⁻¹

B7

Exhaust-gas setting

• CO concentration with engine at normal operating temperature:

2.0...3.0% by vol.CO

• Fuel pressure:

2.8...3.2 bar

• Fuel pump delivery:

min. 675 cm³/30 s

• Solenoid-operated injection valve:

2 ... 3 Ω

• Temperature sensor

NTC I

NTC II

Ambient temperature
(+ 15 ... + 30°C):

1.45...3.3 k Ω

1.30...3.6 k Ω

Engine at normal operating temperature
(approx. + 80°C):

280 ... 360 Ω

250 ... 390 Ω

A7

Test specifications

Lancia Beta, Trevi, HPE, Coupé



- Thermo-time switch for 0 280 130 214

Electrical internal resistance:

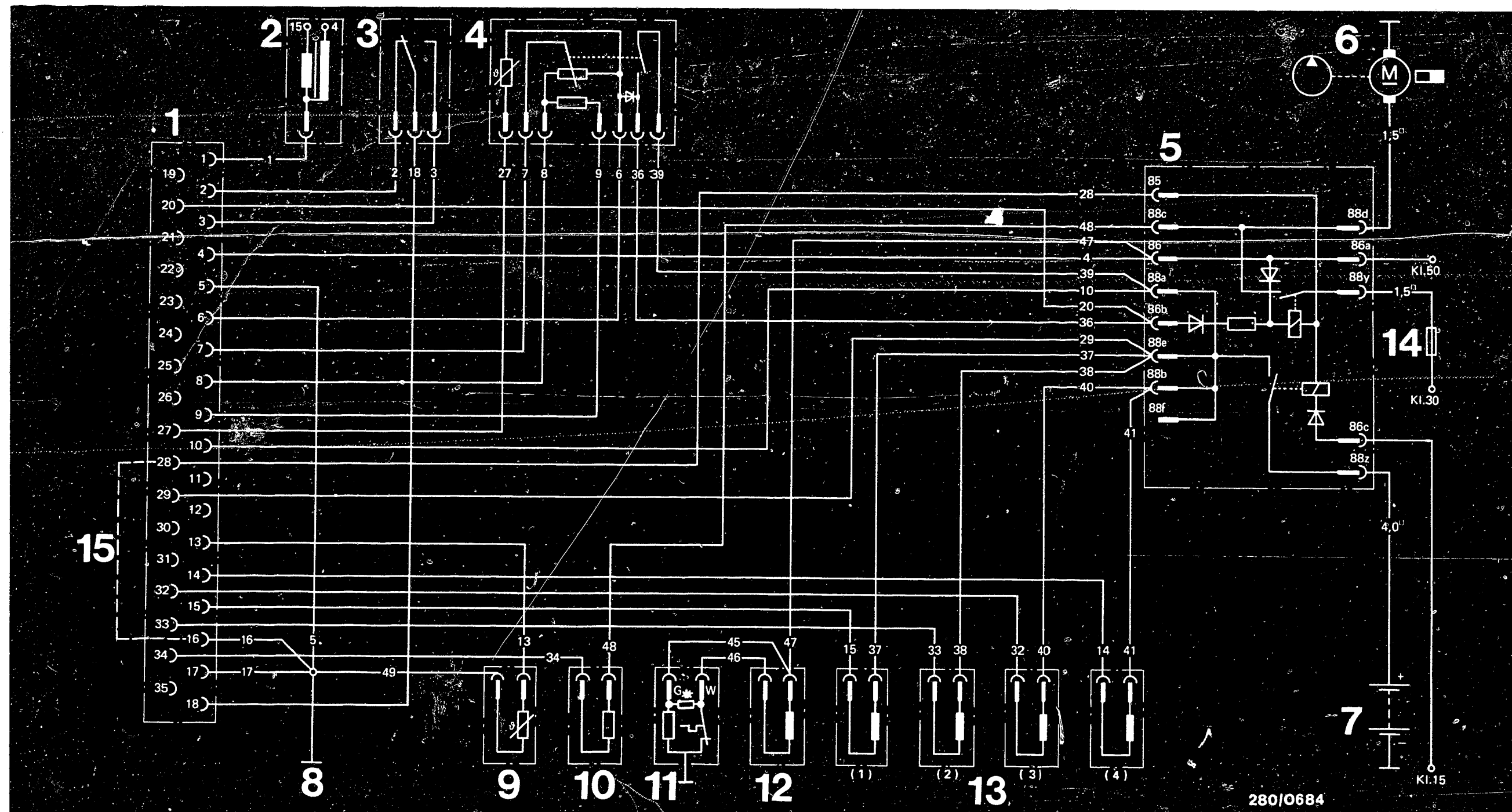
	"G" and ground	"W" and ground	"G" and "W"
Ambient temperature (below + 30°C):	25...40 Ω	0 Ω	25...40 Ω
Engine at normal operating temperature (above +40°C):	50...80 Ω	100...160 Ω	50...80 Ω

- For 0 280 130 221:

	"G" and ground	"W" and ground	"G" and "W"
Considerably below ambient temperature (below + 15°C):	50...70 Ω	0 Ω	50...70 Ω
Ambient temperature (+15 ... +30°C):	50...70 Ω	∞ Ω	∞ Ω

- See equipment and Autodata microfiches for settings for ignition, valve clearance and other engine data.





ELECTRIC TERMINAL DIAGRAM FOR THE L-JETRONIC

1 = Multiple plug	5 = Relay set
2 = Ignition coil	6 = Electric fuel pump
3 = Throttle-valve switch	7 = Battery
4 = Air-flow sensor	8 = Central ground

9 = Temperature sensor II
10 = Auxiliary-air device
11 = Thermo-time switch
12 = Start valve

13 = Injection valves
14 = Pump fuse
* = Resistance inapplicable in ..221
15 = Bridge in control unit

A9

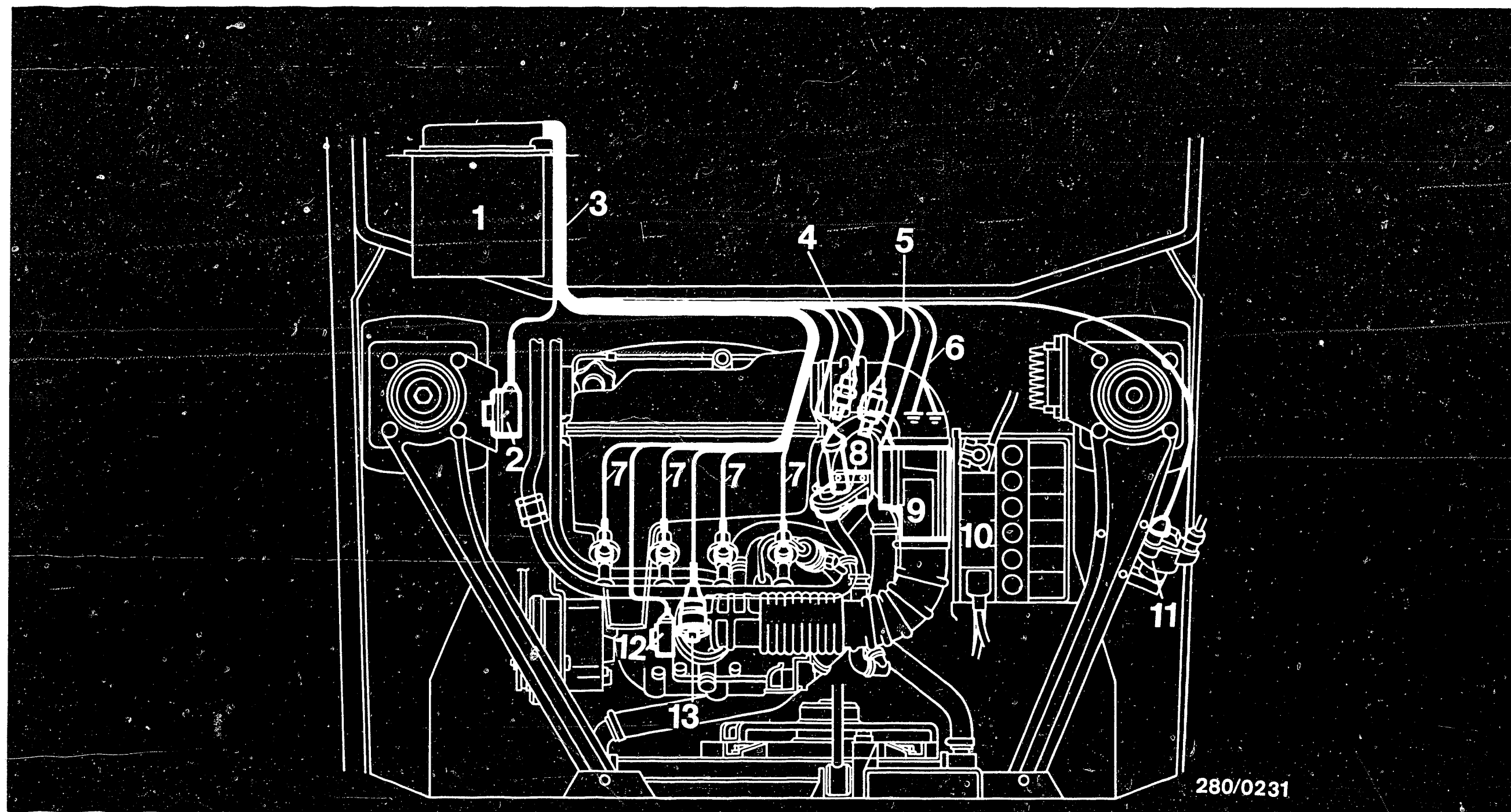
Electrical terminal diagram
Lancia Beta, Trevi, HPE, Coupé



A10

Electrical terminal diagram
Lancia Beta, Trevi, HPE, Coupé





ELECTRICAL WIRING DIAGRAM

1 = Control unit
2 = Relay set
3 = Jetronic wiring harness

4 = Temperature sensor II
5 = Thermo-time switch
6 = Central ground

7 = Injection valves
8 = Auxiliary-air device
9 = Air-flow sensor

10 = Battery
11 = Ignition coil
12 = Throttle-valve switch
13 = Start valve

A11

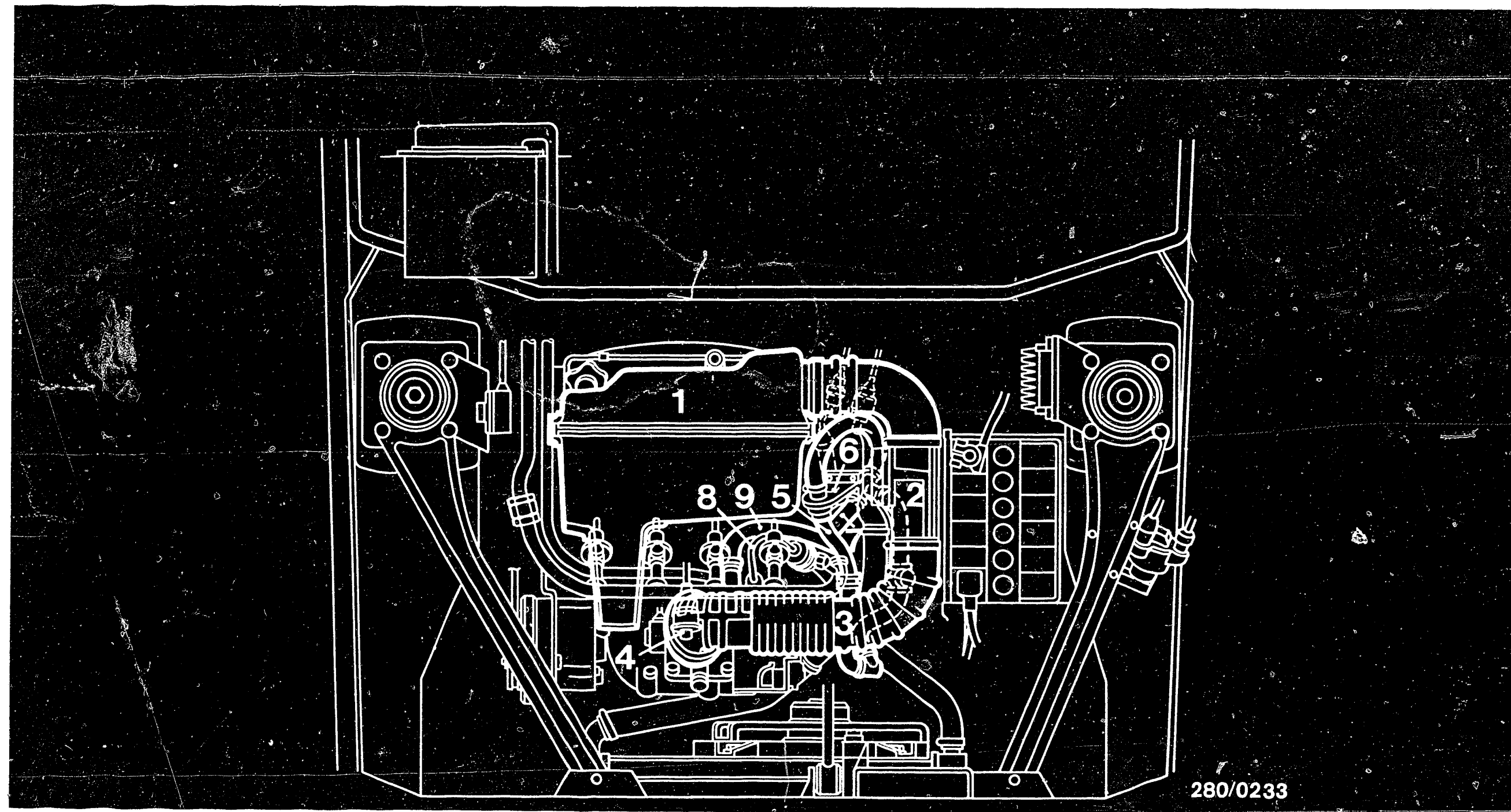
Electrical wiring diagram
Lancia Beta, Trevi, HPE, Coupé



A12

Electrical wiring diagram
Lancia Beta, Trevi, HPE, Coupé





280/0233

DIAGRAM OF AIR AND FUEL LINES

Air hose diagram

1 = Air filter

2 = Air-flow sensor

3 = Air hose between air-flow
sensor and intake manifold

4 = Intake manifold with throttle-
valve

5 = Connection hose for
auxiliary-air device

6 = Auxiliary-air device

7 = Connection hose from auxiliary-
air device and intake manifold

8 = Connection hose to pressure
regulator

9 = Crankcase breather

A13

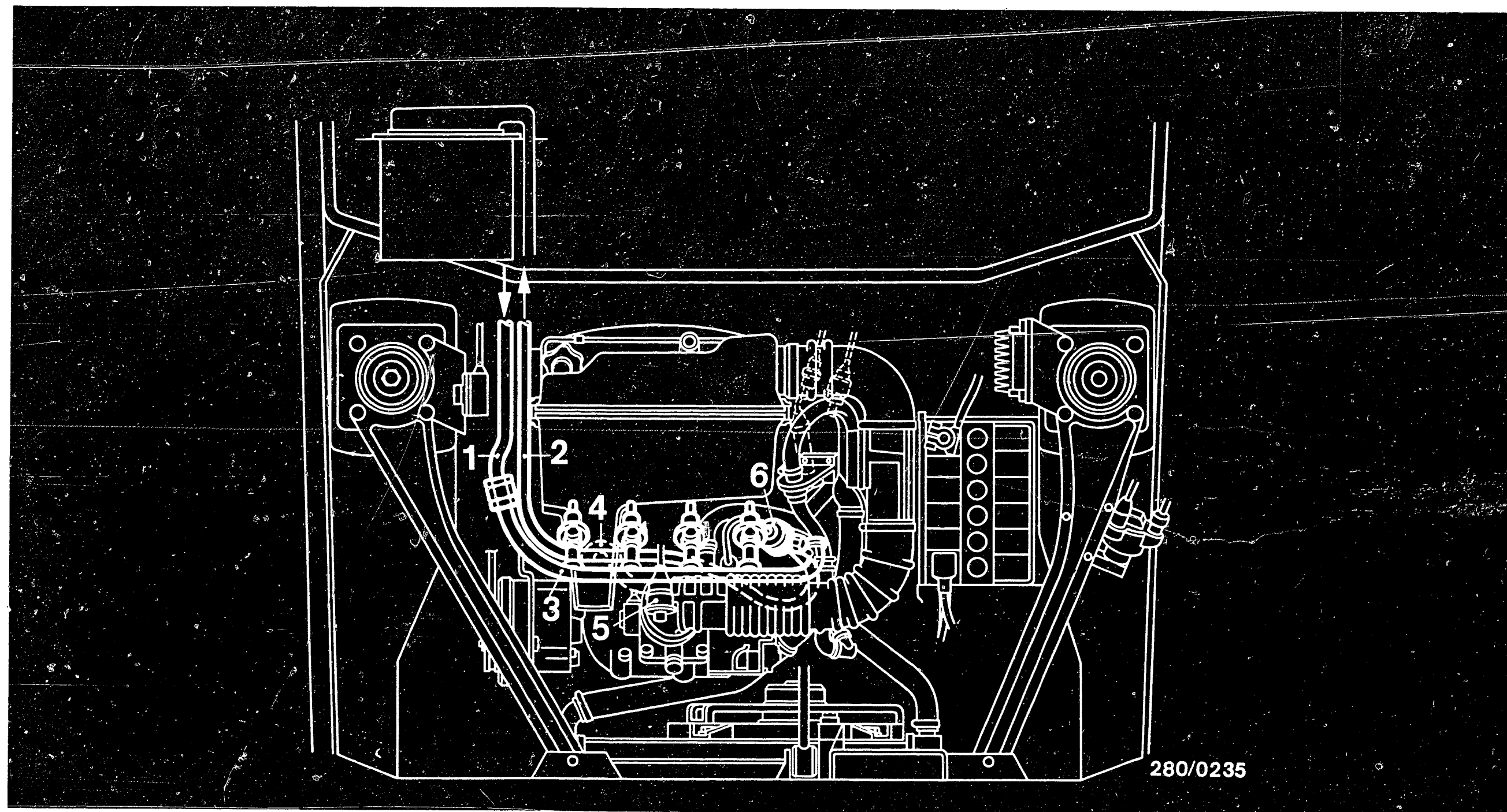
Diagram of air and fuel lines
Lancia Beta, Trevi, HPE, Coupé



A14

Diagram of air and fuel lines
Lancia Beta, Trevi, HPE, Coupé





280/0235

Diagram of fuel lines in engine compartment

1 = Fuel delivery line
2 = Fuel return line

3 = Fuel distribution pipe
4 = Inlet line to start valve

5 = Start valve
6 = Pressure regulator

A15

Diagram of air and fuel lines
Lancia Beta, Trevi, HPE, Coupé



A16

Diagram of air and fuel lines
Lancia Beta, Trevi, HPE, Coupé



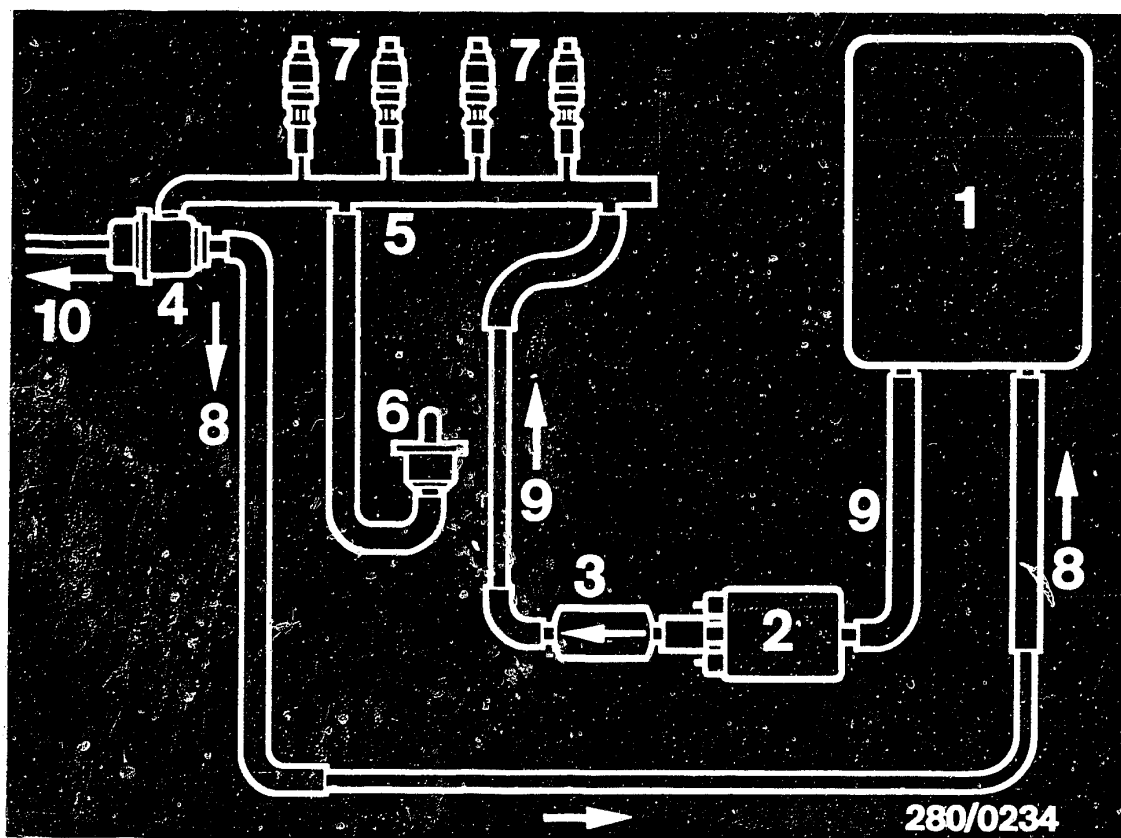


Diagram of fuel lines

- | | |
|--|---|
| 1 = Fuel tank | 6 = Start valve |
| 2 = Electric fuel pump
(tube-type pump) | 7 = Solenoid-operated
injection valves |
| 3 = Fuel filter | 8 = Fuel return line |
| 4 = Pressure regulator | 9 = Fuel delivery line |
| 5 = Fuel-distribution pipe | 10 = To intake manifold |

Delivery line and return line run to the fuel tank at the rear on the left-hand side below the floor panel.

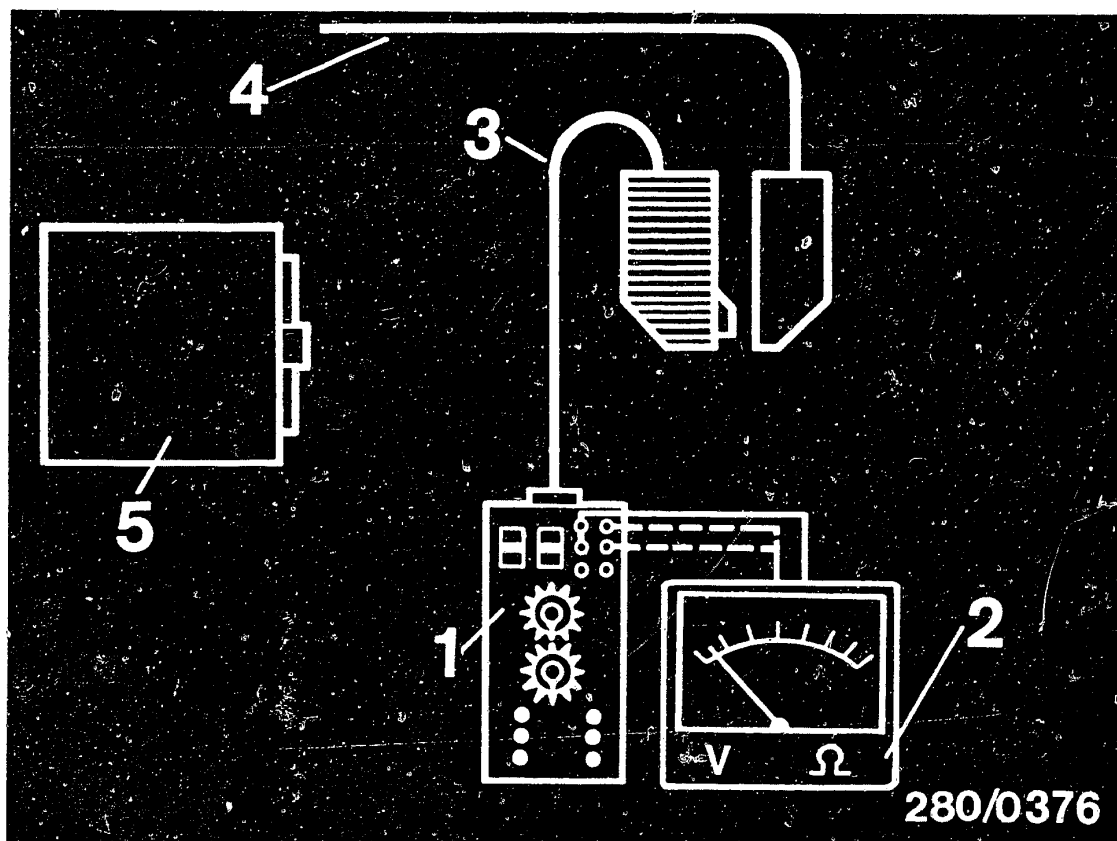


TEST EQUIPMENT AND TOOLS

Description	Designation	Order No.
Universal test adapter Adapter lead	ETT 018.01	0 684 101 801 1 684 463 129
Motortester	e.g. MOT 002.00 MOT 300 MOT 400	0 684 000 200 0 684 000 300 0 684 000 400
Exhaust-gas analyzer Calibrated infra-red exhaust-gas analyzer	e.g. ETT 008.00 ETT 008.04 or ETT 008.05	0 684 100 800 0 684 100 804 0 684 100 805
Pressure gauge	Quality class 1.0 = 6 bar. 0.1 bar divisions	1 687 231 154
Three-way line		KDJE P-100/13
Test lead		1 684 463 093
Pressure tester or pressure tester (no longer avail.)		KDJE-P 100 KDEP 1034
Parts set		1 287 010 701
Electrics tester or multimeter	e.g. ETE 014.00 e.g. Philips PM 2517 X e.g. Miselco Master 50 K e.g. Chinaglia Cortina	0 684 101 400
AF 5 hexagon screwdriver	Commercially available	e.g. Hahn & Kolb No. 52 138
Injection valve		0 280 150 121

Suitable, commercially available tools should be used for fitting and removing the idle CO anti-tamper device on air-flow sensor.





- 1 = Universal test adapter 4 = Vehicle wiring harness
 2 = Multimeter
 3 = Adapter lead (L-Jetronic) 5 = L-Jetronic control unit

General:

The universal test adapter is plugged onto the vehicle wiring harness with the adapter lead.

Caution:

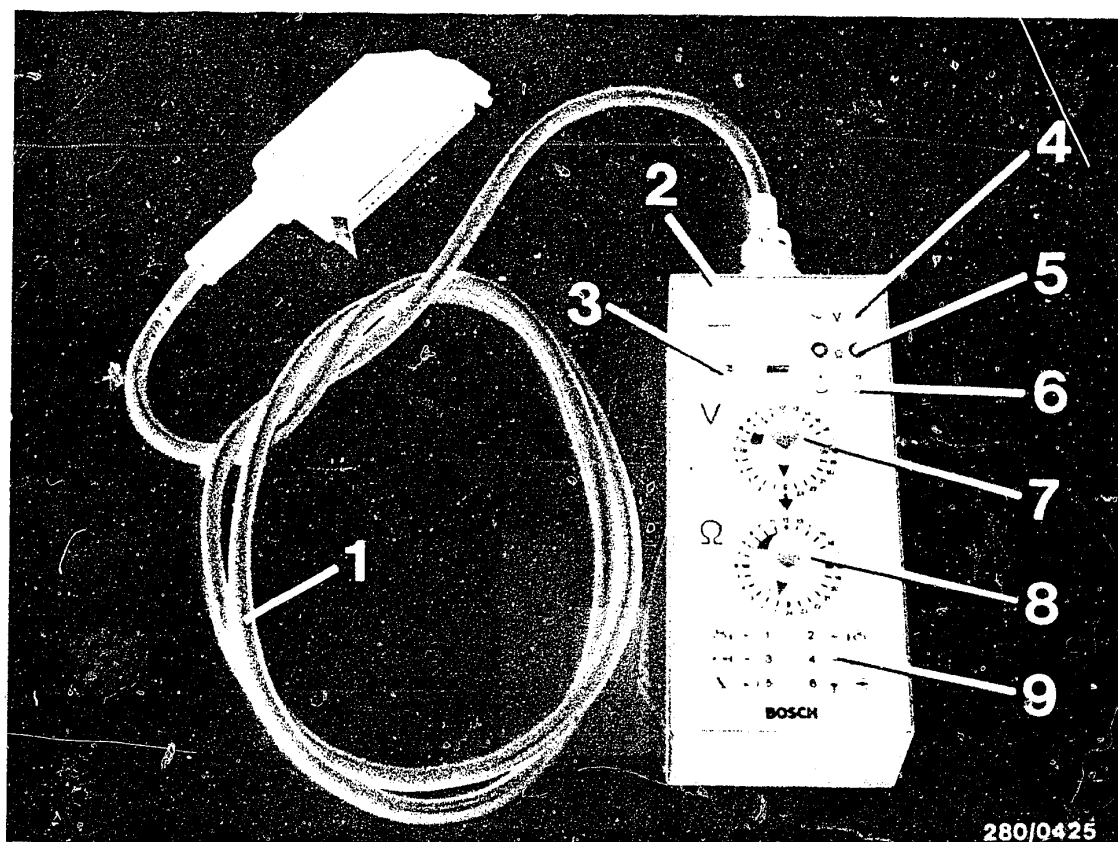
Connect and disconnect the universal test adapter only with the ignition off:

Testing:

For testing, connect a multimeter with R_i min. 20 k Ω /V to the test adapter.

It is also possible for the signal from term. 1 of the ignition coil to be measured with a motortester via the special input.



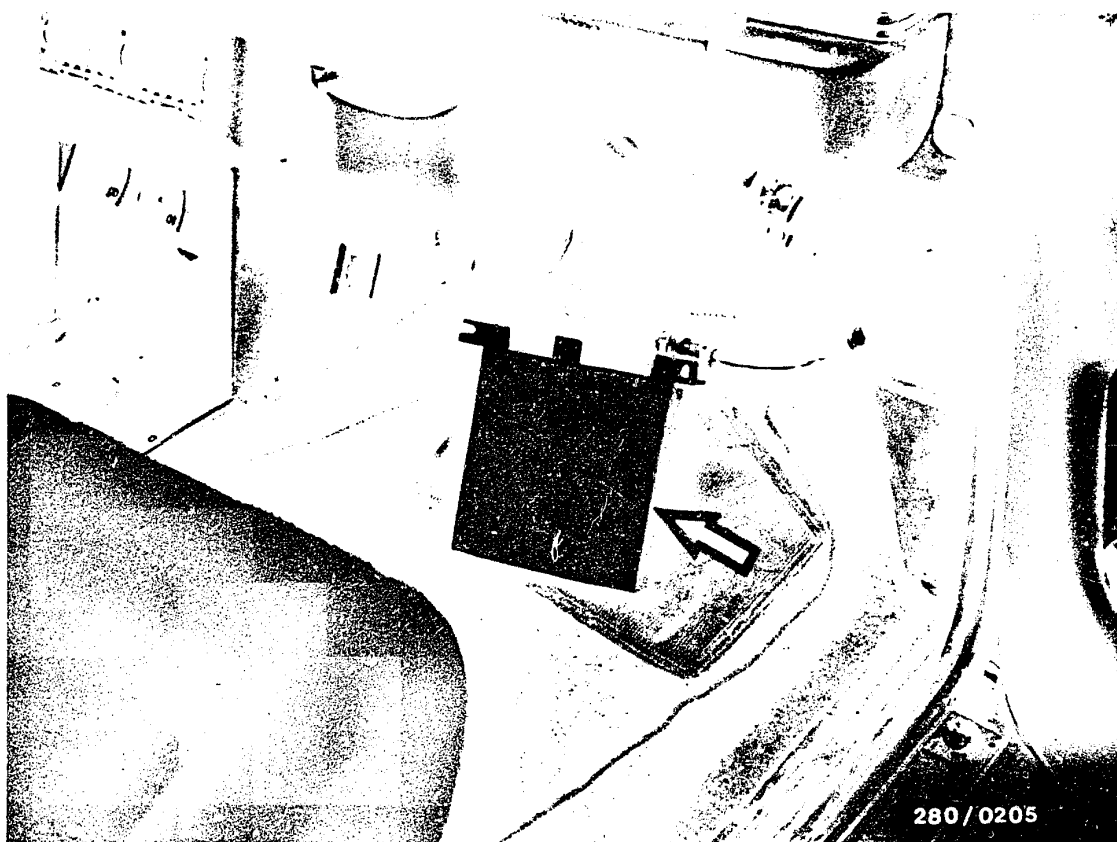


280/0425

Universal test adapter with adapter lead for L-Jetronic

- 1 = Adapter lead (Part No.: 1 684 463 129)
- 2 = Universal test adapter (Part No.: 0 684 101 801)
- 3 = Test wells (for motortester)
- 4 = Test sockets (for voltage measurement)
- 5 = Test sockets (for resistance measurement)
- 6 = Test sockets (not yet occupied)
- 7 = Program switch "volt"
- 8 = Program switch "ohm"
- 9 = Button panel (not occupied for L-Jetronic)



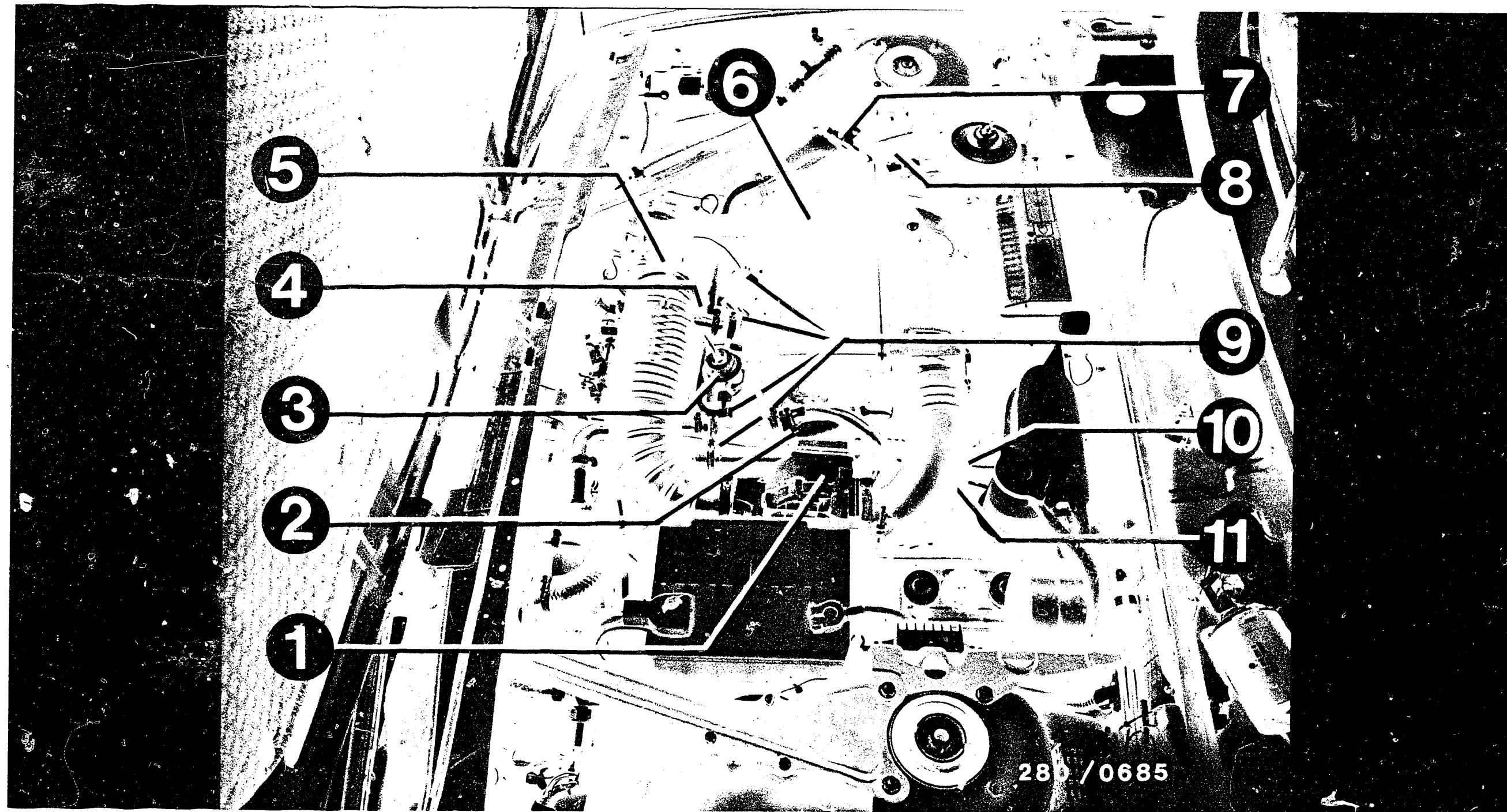


Arrow = Control unit

Installation position of the components (continued)

The control unit is situated in the footwell of the passenger seat and fastened with 3 screws.





INSTALLATION POSITION OF THE COMPONENTS

- 1 = Air-flow sensor
- 2 = Auxiliary-air device (black plug)
- 3 = Pressure regulator

- 4 = Throttle-valve switch
- 5 = Start valve (blue plug)
- 6 = Air filter
- 7 = Pump fuse
- 8 = Relay set

- 9 = Injection valves
 - 10 = Temperature sensor II (white plug)
 - 11 = Thermo-time switch (brown plug)
- Fuel pump and fuel filter:
Beneath the vehicle on right-hand side,
near rear axle.

A22

Installation position of the components
Lancia Beta, Trevi, HPE, Coupé



A23

Installation position of the components
Lancia Beta, Trevi, HPE, Coupé



Important general information

1. Never start engine without securely connected battery.
2. Do not use a starting aid with more than 16 V or a fast charger for starting.
3. Never disconnect battery from vehicle electrical system with engine running.
4. Disconnect battery from vehicle electrical system when fast charging.
5. Remove control unit at temperatures above 80°C (paint drying installation).
6. Ensure that all connectors of wiring harness are properly attached.
7. Never connect or disconnect wiring-harness plug of control unit with ignition switched on.
8. When testing compression, cut the red power supply lead between battery and relay set by disconnecting the plug-in connection.
This ensures that the voltage supply for the L-Jetronic and therefore also for the injection valves is interrupted. Undesired injecting is thus prevented.
9. Remove the L-Jetronic control unit before carrying out electric welding work (e.g. spot welding).
10. When using the following trouble-shooting program it is assumed that the engine is in proper working order and that the ignition is correctly set. The electrical system must be checked and, if necessary, repaired.
11. Proceed according to microcard ALL-500 when installing an alarm system.

In order to carry out the testing operations described in this manual and in order to assess the components, you should be familiar with the L-Jetronic and how it works. The essential points regarding the operation and construction of the L-Jetronic are described in Technical Instruction VDT-U 3/3 En.



Trouble-shooting

The following trouble-shooting programs are designed to enable workshop employees, using the universal test adapter with adapter lead (1 684 463 129) and other suitable test equipment, to quickly locate causes of trouble on the L-Jetronic. Depending on the level of knowledge and experience of the mechanic, a choice can be made between the following procedures:

- Detailed step-by-step trouble-shooting for employees with little experience or practice on L-Jetronic vehicles.
- Pin-pointed direct trouble-shooting for trained, experienced employees who have had a great deal of practice on L-Jetronic vehicles.

B3**B5**

Both trouble-shooting programs begin by checking the electrical/electronic part of the L-Jetronic with the aid of the universal test adapter with adapter lead. In this way, the wiring harness with the connected components is soon checked for proper electrical operation and faults are quickly located.

If no fault is found using the universal test adapter, it is necessary to test the fuel pressure.

If no fault is found, continue trouble-shooting with the detailed or the direct trouble-shooting program.

B1Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé

**B2**Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



1. Detailed step-by-step trouble-shooting

1.1 Test with universal test adapter

This test must come at the beginning of the test program and must be performed from beginning to end (Coordinates B9...D15).

1.2 Fuel pressure test

This test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates D16...E 2).

1.3 Trouble-shooting according to customer complaints (symptoms of trouble)

The table below contains possible symptoms of trouble and gives the first coordinate of the relevant detailed trouble-shooting program in the column on the right.

The trouble-shooting program consists of logically ordered test procedures for all individual components of the L-Jetronic. If, after completing the trouble-shooting program for an assumed trouble, the fault has not been detected or remedied, take a new symptom of the trouble and work through another program.

<u>Customer complaints (symptoms of trouble)</u>	<u>Universal test adapter</u>	<u>Fuel pressure test</u>	<u>Coordinate</u>
1. Engine fails to start or starts only with great difficulty	B 9	D 16	E 3
2. Engine starts but then dies	B 9	D 16	E 21
3. Uneven engine idle	B 9	D 16	F 11
4. Poor throttle take-up	B 9	D 16	G 11
5. Engine missing under all operating conditions	B 9	D 16	H 1
6. Fuel consumption too high	B 9	D 16	J 3
7. No maximum engine power	B 9	D 16	J 13
8. CO concentration at idle too high or too low	B 9	D 16	K 1

B3

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



B4

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



2. Pin-pointed direct trouble-shooting

2.1 Test with universal test adapter with adapter lead 1 684 463 129

The test with the universal test adapter must come at the beginning of the test program and must be performed from beginning to end (Coordinates B 9...D15).

2.2 Fuel pressure test

The fuel pressure test must come immediately after the test with the universal test adapter and must be performed from beginning to end (Coordinates D16...E 2).

2.3 Trouble-shooting according to customer complaints

The table below contains various symptoms of trouble with several possible causes of the trouble in each case. The coordinate reference field indicates the first coordinate of the test procedure for the respective L-Jetronic component. If, after testing the individual components, the fault has not been detected or remedied, choose a new symptom of the trouble.

Customer complaint (symptom of trouble)

1. Engine fails to start or starts only with great difficulty								
2. Engine starts but then dies								
3. Uneven engine idle, idle speed incorrect								
4. Poor throttle take-up								
5. Engine missing under all operating conditions								
6. Fuel consumption too high								
7. No maximum engine power								
8. CO concentration at idle too high or too low								
<u>Cause</u> (component fault)								
B9	B9	B9	B9	B9	B9	B9	B9	Universal test adapter
D16	D16	D16	D16	D16	D16	D16	D16	Fuel pressure test: Pressure regulator defective, relay set defective, fuel pump not operating, pump contact not closing.
E13	F 1							Auxiliary-air device not opening
		F19	G15					Auxiliary-air device not closing
E17	F 5	G 3	G17	H 5	J 9	J21	K 5	Air-flow sensor defective, potentiometer test (noise test)
	F 5			H 9				Pump contact in air-flow sensor defective (engine stopped)
	F 7	G 5						Air valve defective

Continued on B7/B8

B5

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



B6

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



Customer complaints (symptoms of trouble) (continued)

1. Engine fails to start or starts only with great difficulty								
2. Engine starts but then dies								
3. Uneven engine idle, idle speed incorrect								
4. Poor throttle take-up								
5. Engine missing under all operating conditions								
6. Fuel consumption too high								
7. No maximum engine power								
8. CO concentration at idle too high or too low								
Cause (component fault)								
E 9		F 15						Thermo-time switch defective
E19	F 9	G 7	G21			J23	K11	Air-intake system leaking
		F21		H13	J 9	J17		Solenoid-operated injection valves defective; connect test lead
E 5								Start valve not opening
E 7	E23	F17			J 5		K 7	Start valve leaking
				H19		J19		Fuel delivery too low
E15	F 3				J 7		K 7	Temperature sensor II in engine defective
		F13	G13	H21				Throttle valve not closing (test overrun cutoff)
						J15		Throttle valve not opening fully
				H 3		J23		Poor central ground, loose contacts, faulty plug-in connections
E19		G 7						Open circuit in wiring harness and plug-in connections; interference; missing
		F13	G13			J15		Throttle-valve switch defective
		G 9	G23		J11		K 3	CO exhaust-gas setting too rich, idle adjustment
		G 9	G23	H21			K 3	CO exhaust-gas setting too lean, idle adjustment, burbling
				H19		J17		Control unit defective

B7

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



B8

Trouble-shooting

Lancia Beta, Trevi, HPE, Coupé



TEST CHART FOR UNIVERSAL TEST ADAPTER

with L-Jetronic-system adapter lead (1 684 463 129)
connected

Test chart for Lancia 2.0 l engine

Carefully plug the universal test adapter onto the vehicle wiring harness. (Ignition must be off). Only the peripherals are tested.

For taking measurements, a multimeter (for voltage and resistance measurements) as well as a motortester must be connected to the universal test adapter.

The individual test steps are selected by means of two program switches (one for voltage measurements, the other for resistance measurements). Each program switch has 24 test positions, but not all of these are occupied for the L-Jetronic. Be sure to follow the instructions in the test chart.

Test steps 1...10 measure voltages during starting.

Caution: Set the multimeter to the voltage range.

Test steps 11...19 measure resistances.

Caution:

Set the multimeter to the resistance measuring range.

While trouble-shooting, ignition "OFF" and remove multiple plug of adapter lead.

The test specifications and operating instructions for the universal test adapter are given in the following test chart.

Installation position of control unit:

In the passenger compartment, on the passenger side, in footwell behind a cover. It is fastened in position by 3 screws.



Requirements for correct test procedure:

1. Start testing with test step 1.
2. The sequence of the test steps must be kept to. In each case, the trouble-shooting set out below each test step is based on the trouble-shooting set out below the previous test steps.
Example: If, in test step 2 the ground connection term. 28 for the relay set is tested, this test is not repeated in the following test steps.
3. If an incorrect reading is obtained for a test step, this test step must be repeated after the fault has been remedied.

Note:

In the following test steps a white border in the "Operation" column indicates which operation has to be changed in comparison with the preceding test step.



Test step 1		Reading		Testing
Operation				
<u>Program switch position "V":</u>	3	Multimeter must indicate <u>8 ... 15 V.</u>		<u>Component:</u> Relay set Starting motor term. 50
<u>Program switch position: "Ω"</u>	1)			
<u>Measuring equipment:</u> Multimeter (Volt range)				<u>Operation:</u> Starting signal
<u>Measuring range:</u> 0...15 V				
<u>Connection:</u> Test sockets red (+) and black (-)		yes ↓ Continue testing with next test step.	no ↓	<u>Malfunction:</u> No voltage reading
<u>Operation in vehicle:</u> Ignition "ON" and operate starting motor				

Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (when operating starting motor).
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

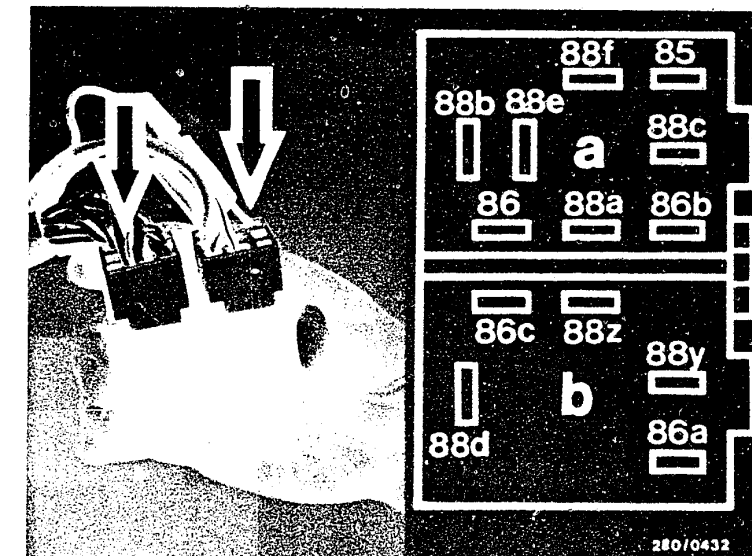
For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

- 1) Switch position not specified

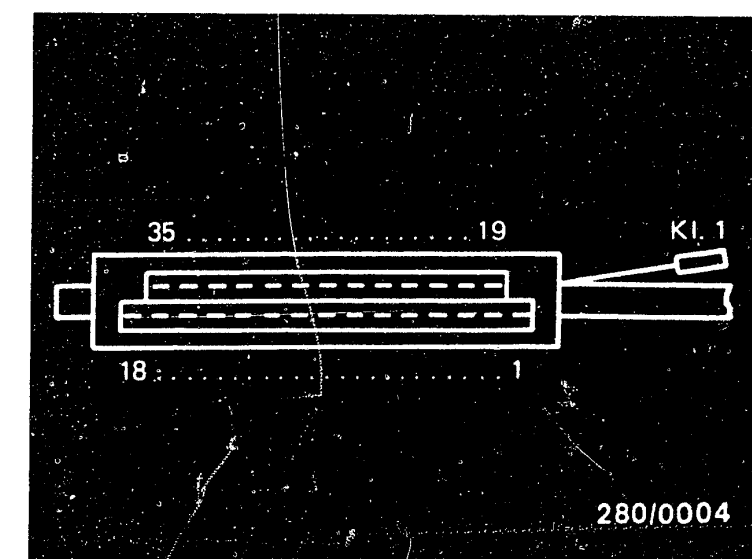
Continued on B13/B14



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
K1.1 = Term. 1



B11

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



B12

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Voltage reading below 8 V:

Battery insufficiently charged or high voltage drops.

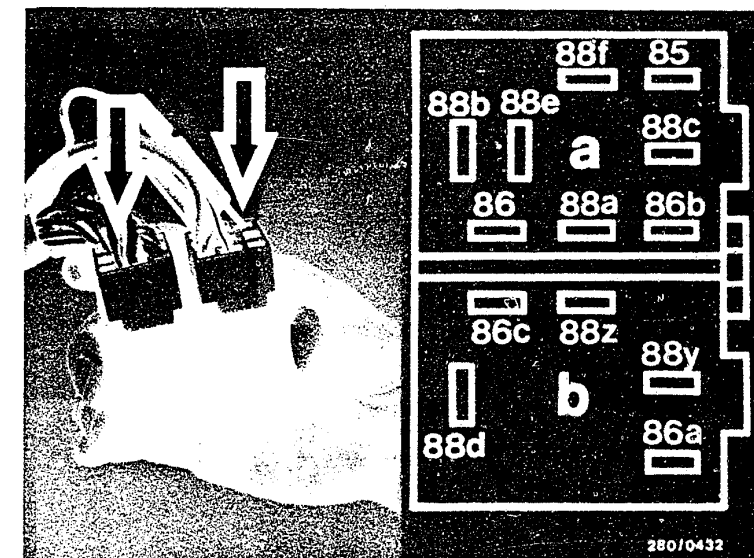
No voltage reading:

1. Voltage at relay set term. 86a? If no voltage, test lead to starting motor term. 50. Test ground connection from multiple plug term. 5 to central ground.
2. Voltage at relay set term. 86? If no voltage, replace relay set.
3. Test lead from relay set term. 86 to multiple plug term. 4.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

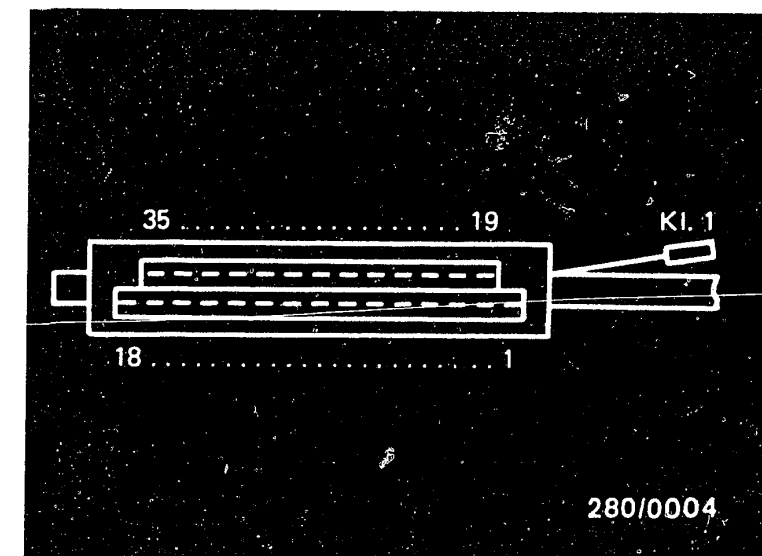
- Relay set: On right-hand spring strut.
- Central ground: In engine compartment between air filter and air-flow sensor on left-hand side of engine block.
- Control unit: Passenger side, in footwell behind a cover.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



B13

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé

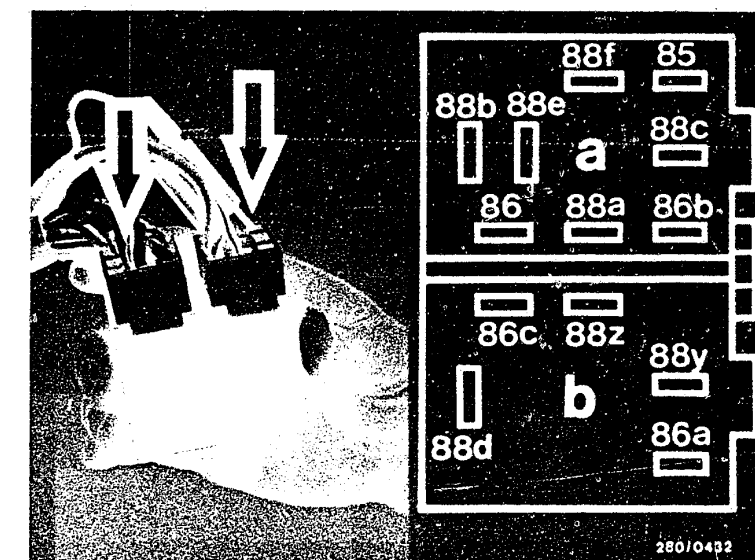


B14

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



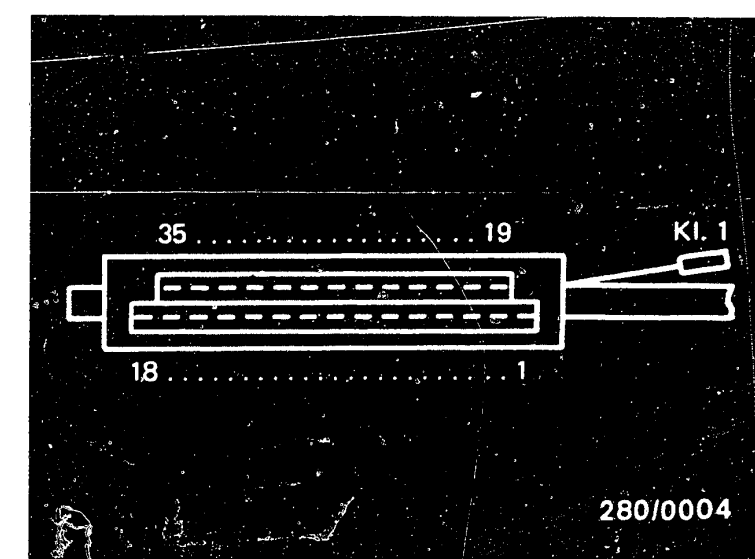
Test step 2			
Operation		Reading	Testing
<u>Program switch position "V":</u>	4	Multimeter must indicate <u>8 ... 15 V.</u>	<u>Component:</u> Auxiliary-air device, relay set
<u>Program switch position: "Ω"</u>	-		
<u>Measuring equipment:</u> Multimeter (Volt range)		<div><div>yes</div><div>Continue testing with <u>next test step.</u></div></div> <div><div>no</div><div></div></div>	<u>Operation:</u> Power supply
<u>Measuring range:</u> 0 ... 15 V			
<u>Connection:</u> Test sockets red (+) and black (-)			
<u>Operation in vehicle:</u> Ignition "ON" and operate starting motor			
			<u>Malfunction:</u> No reading



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V (when operating starting motor).
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

a) Start engine; electric fuel pump operates.

1. Voltage at relay set term. 88c? If no voltage, test lead 28 from relay set term. 85 to multiple plug term. 16 to central ground. If fault not eliminated, replace relay set.

Continued on B17/B18

B 15

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



B 16

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Trouble-shooting (continued)

2. Voltage at auxiliary-air device term. 48? If no voltage, test lead 48 from auxiliary-air device to relay set term. 88c.
3. Test auxiliary-air device for continuity. Set value 35 ... 70 Ω . If not, replace auxiliary-air device.
4. Test lead 34 from auxiliary-air device to multiple plug term. 34.

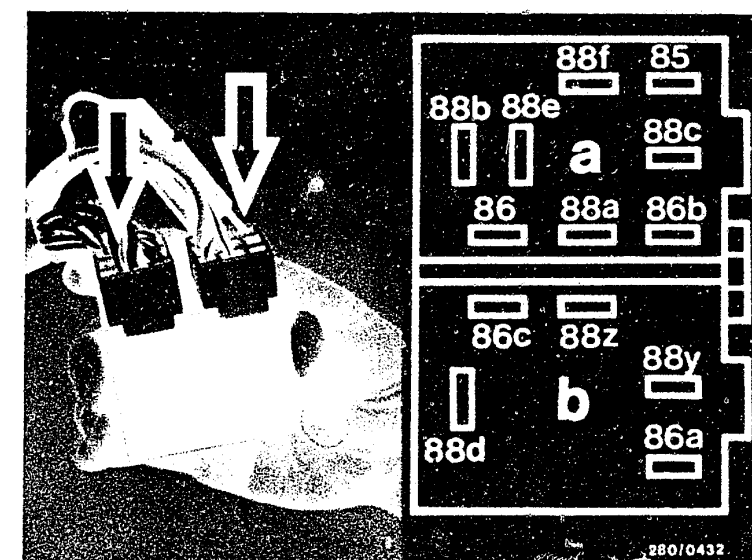
b) Crank engine; electric fuel pump does not operate

1. Voltage at relay set term. 88y? If no voltage, test pump fuse and power supply term. 30.
2. Voltage at relay set term. 88d? If no voltage, replace relay set.
3. Test electric fuel pump and leads (ground connection).
4. Voltage at relay set term. 88c? If no voltage, test lead 28 from relay set term. 85 to multiple plug term. 28 and multiple plug term. 16 to central ground. If fault not eliminated, replace relay set.
5. Voltage at auxiliary-air device term. 48? If no voltage, test lead 48 from auxiliary-air device to relay set term. 88c.
6. Test auxiliary-air device for continuity. Set value 35 ... 70 Ω . If not, replace auxiliary-air device.
7. Test lead 34 from auxiliary-air device to multiple plug term. 34.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

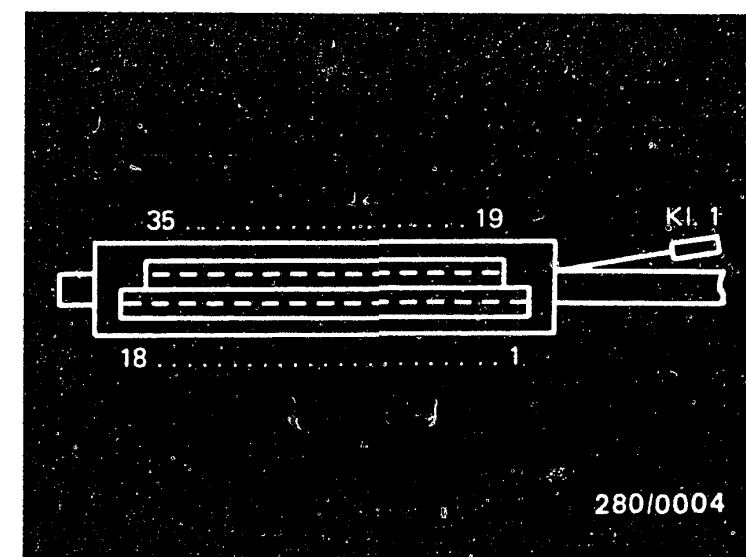
Relay set:	On right-hand spring strut.
Control unit:	Passenger side, in footwell, behind a cover.
Auxiliary-air device:	Left-hand side in engine compartment.
Fuel pump fuse:	On right-hand spring strut in front of relay set.
Electric fuel pump:	Beneath vehicle on right-hand side, close to rear axle.
Ground lead for electric fuel pump:	In luggage compartment above spare wheel to right-hand side on ground point.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



B 17

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé

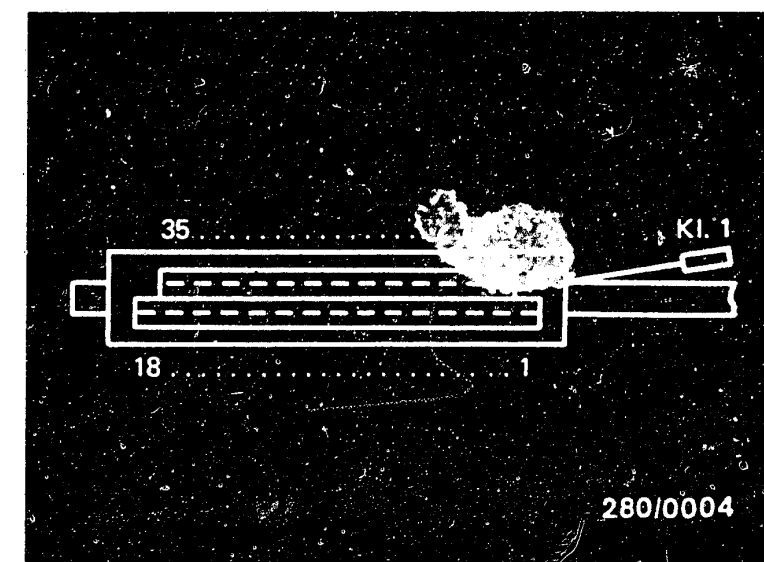


B 18

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 3			
Operation		Reading	Testing
Program switch position "V":	5	Ignition oscilloscope must indicate ignition pulses.	Component: Signal from term. 1
Program switch position: "Ω"	-		
Measuring equipment: Motortester		<div><div>yes</div><div>Continue testing with next test step.</div></div> <div>no</div>	Operation: Triggering of control unit by the ignition
Measuring range: Special input, control lever all the way to the left Measuring range .20 V			Malfunction: No reading
Connection: Test wells			
Operation in vehicle: Ignition "ON" and operate starting motor			



Top view of multiple plug
Kl. 1 = Term. 1

Trouble-shooting:
 For all voltage measurements:
 1. Set value 8...15 V (when operating starting motor).
 2. Make measurement at the respective component plug.
 3. The connector remains plugged onto the relay set.
 For resistance measurements:
 For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.
 Important! Ignition "OFF" and ensure proper electrical connection when measuring.
 Lead from multiple plug term. 1 to ignition coil term. 1 dropped off?
 Test and, if necessary, repair.
 Voltage at ignition coil term. 1? If not, check ignition system. If voltage present, test lead 1 for continuity or for short circuit to ground.
 If the lead is O.K., then the trigger stage in the control unit has failed. Replace control unit.

Installation position of components:
 Control unit:
 Passenger side, in footwell, behind a cover.
 Central ground:
 In engine compartment between the air filter and the air-flow sensor on left-hand side of engine block.

Test step 4			
Operation		Reading	Testing
Program switch position "V":	6	Multimeter <u>must</u> indicate <u>8 ... 15 V .</u>	Component: Relay set, power supply
Program switch position: "Ω"	-		
Measuring equipment: Multimeter (Volt range)			
Measuring range: 0...15 V		<div>yes</div> <div>no</div>	Operation: Power supply
Connection: Test sockets red (+) and black (-)			
Operation in vehicle: Ignition "ON"			
		Continue testing with <u>next test step.</u>	Malfunction: No voltage reading

Trouble-shooting:

For all voltage measurements:

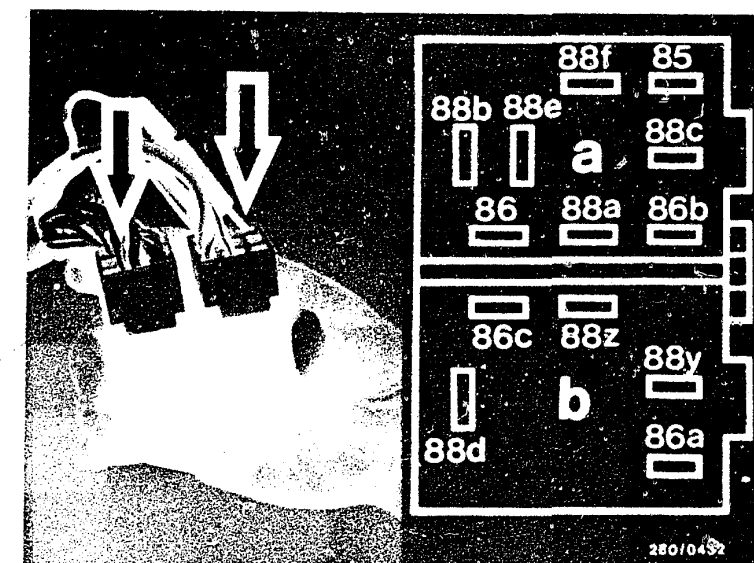
1. Set value 8...15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

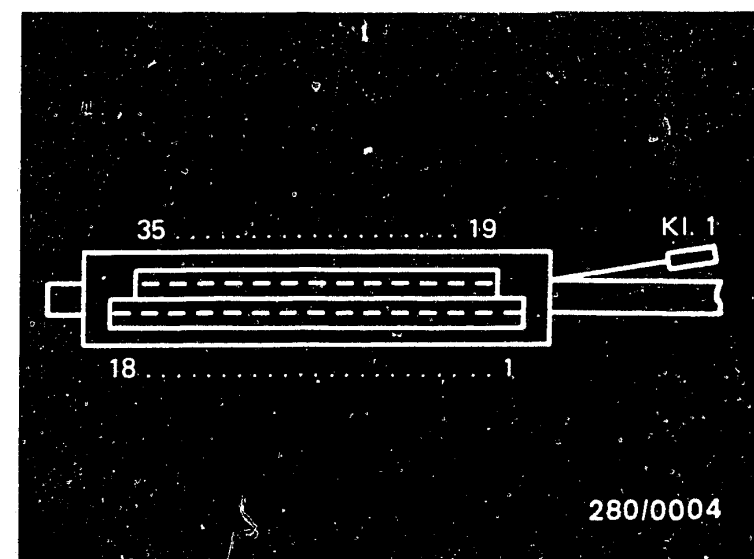
1. Voltage at relay set term. 86c? If not, check lead term. 15.
2. Voltage at relay set term. 88z? If not, test lead to battery (positive terminal).
(Caution: Ignition "OFF" and disconnect positive connection from battery).
3. Voltage at relay set term 88a? If not, replace relay set.
4. Test lead 10 from relay set term. 88a to multiple plug term. 10 for continuity. Eliminate contact resistances at the plug-in connections.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
KI. 1 = Term. 1



B21

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé

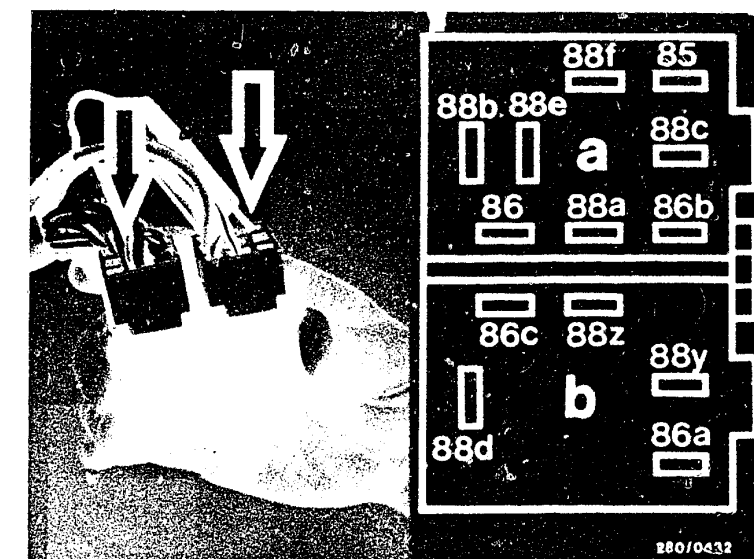


B22

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



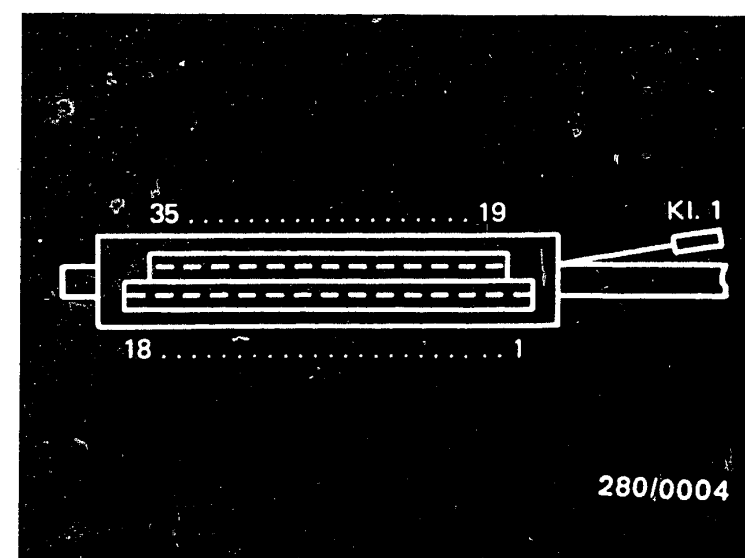
Test step 5			
Operation		Reading	Testing
<u>Program switch position "V":</u>	7	Multimeter must indicate <u>8 ... 15 V.</u>	<u>Component:</u> Control unit Relay set
<u>Program switch position: "Ω"</u>	-		
<u>Measuring equipment:</u> Multimeter (Volt range)		<div><div></div><div>yes</div><div>↓</div><div>Continue testing with <u>next test step.</u></div></div> <div><div></div><div>no</div><div>↓</div><div></div></div>	<u>Operation:</u> Power supply to 1st solenoid-operated injection valve
<u>Measuring range:</u> 0...15 V			
<u>Connection:</u> Test sockets red (+) and black (-)			
<u>Operation in vehicle:</u> Ignition "ON"			
			<u>Malfunction:</u> No voltage reading



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



Trouble-shooting:

For all voltage measurements:

1. Set value 8...15 V.
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

Continued on C1/C2

B23

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



B24

Test chart vor universal test adpater
Lancia Beta, Trevi, HPE, Coupé



Trouble-shooting (continued)

1. Voltage at relay set term. 88e? If not, replace relay set.
2. Test plug-in connection at 1st solenoid-operated injection valve. If defective, repair plug-in connection.
3. Voltage at injection valve connector term. 37? If not, test lead from injection valve connector to relay set term. 88e.
4. Test lead 15 from injection valve connector to multiple plug term. 15 for continuity.

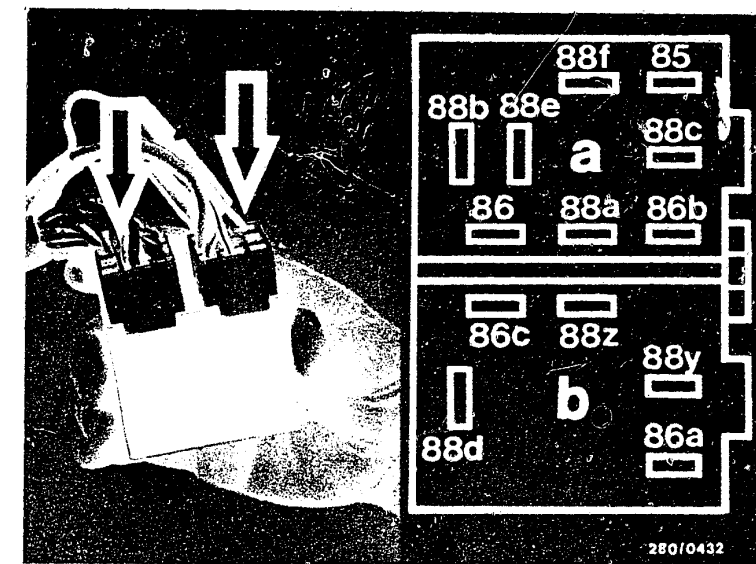
Eliminate contact resistances at the plug-in connections.

Installation position of components:

Relay set: On right-hand spring strut.

Control unit: Passenger side, in footwell, behind a cover.

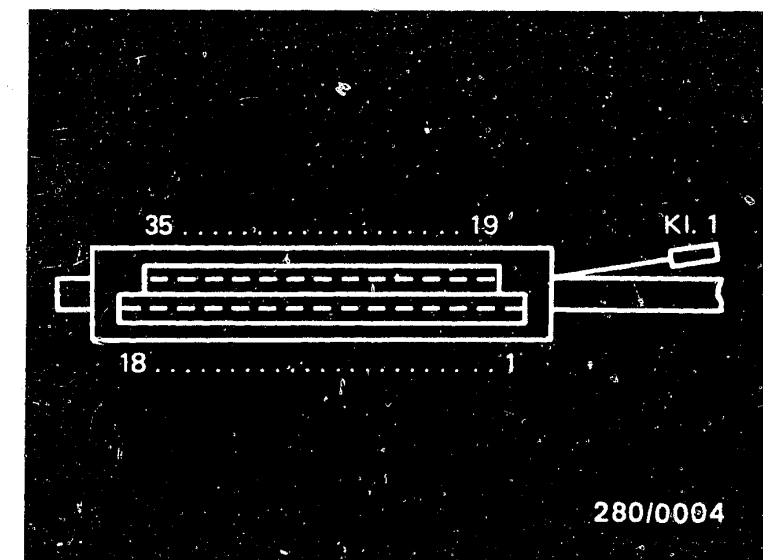
Injection valve: Between intake manifold and engine block.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C1

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C2

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 6			
Operation		Reading	Testing
<u>Program switch position "V":</u>	8	Multimeter must indicate 8 ... 15 V.	<u>Component:</u> Control unit, Relay set
<u>Program switch position: "Ω"</u>	-		
<u>Measuring equipment:</u> Multimeter (Volt range)		<div>yes</div> <div>Continue testing with next test step.</div> <div>no</div>	<u>Operation:</u> Power supply to 2nd solenoid-operated injection valve
<u>Measuring range:</u> 0...15 V			<u>Malfunction:</u> No voltage reading
<u>Connection</u> Test sockets red (+) and black (-)			
<u>Operation in vehicle:</u> Ignition "ON"			

Trouble-shooting:

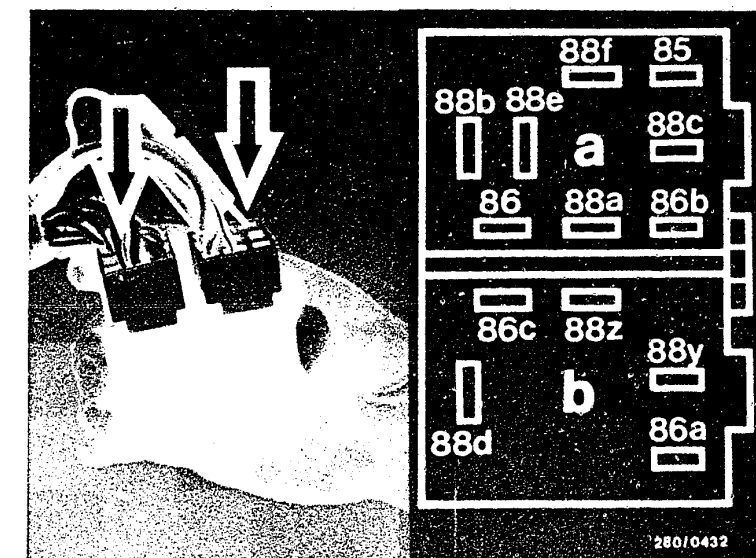
For all voltage measurements:

1. Set value 8 ... 15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

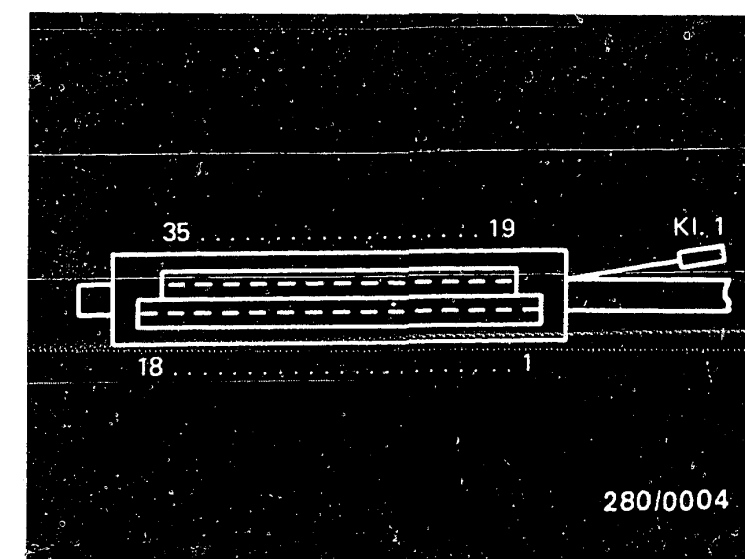


Measure voltage on back of plug

a = Jetronic wiring harness

b = Vehicle wiring harness

Top view of multiple plug
Kl. = Term. 1



Continued on C5/C6

C3

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C4

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Trouble-shooting (continued)

1. Voltage at relay set term. 88e? If not, replace relay set.
2. Test plug-in connection on 2nd solenoid-operated injection valve. If defective, repair plug-in connection.
3. Voltage at injection valve connector term. 38? If not, test lead from injection valve connector to relay set term. 88e.
4. Test lead 33 from injection valve connector to multiple plug term. 33 for continuity.

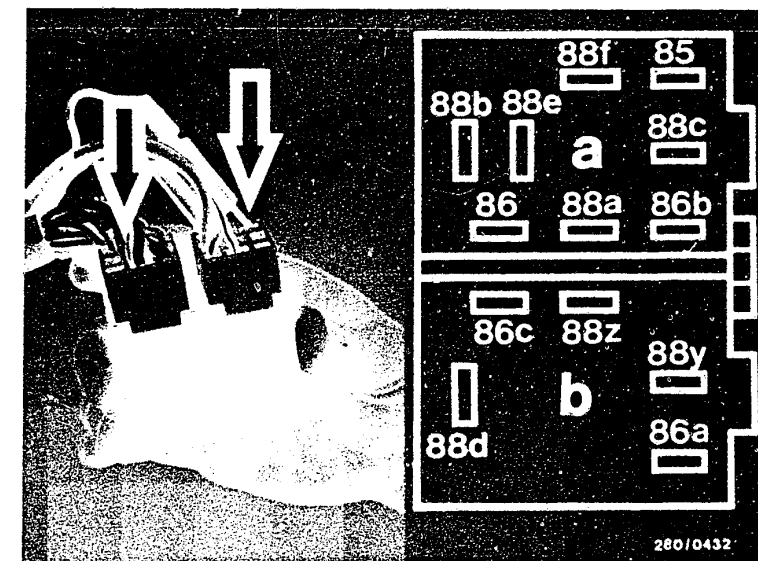
Eliminate contact resistances at the plug-in connections.

Installation position of components:

Relay set: On right-hand spring strut.

Control unit: Passenger side, in footwell, behind a cover.

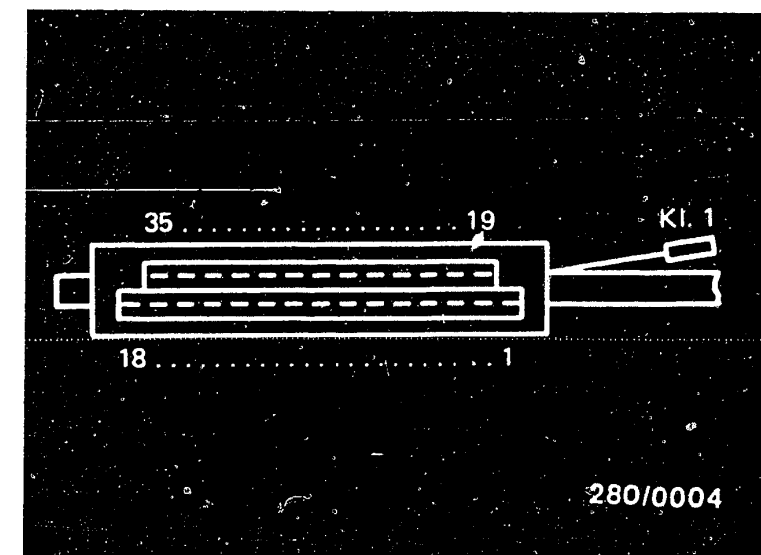
Injection valve: Between intake manifold and engine block.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C5

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C6

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 7			
Operation		Reading	Testing
Program switch position "V":	9	Multimeter must indicate 8 ... 15 V.	<u>Component:</u> Control unit, Relay set <u>Operation:</u> Power supply to 3rd solenoid-operated injection valve <u>Malfunction:</u> No voltage reading
Program switch position: "Ω"	-		
Measuring equipment: Multimeter (Volt range)			
Measuring range:		yes ↓ Continue testing with next test step.	
0 ... 15 V			
<u>Connection</u> Test sockets red (+) and black (-)			
<u>Operation in vehicle:</u> Ignition "ON"		no ↓	

Trouble-shooting:

For all voltage measurements:

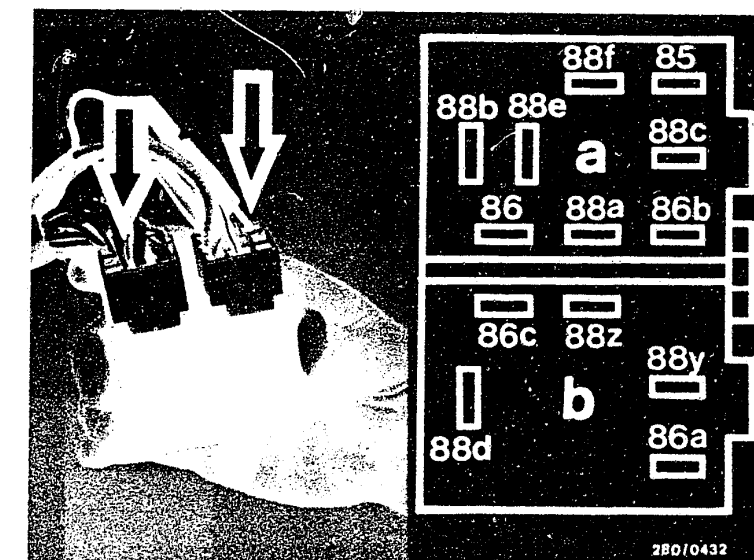
1. Set value 8 ... 15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

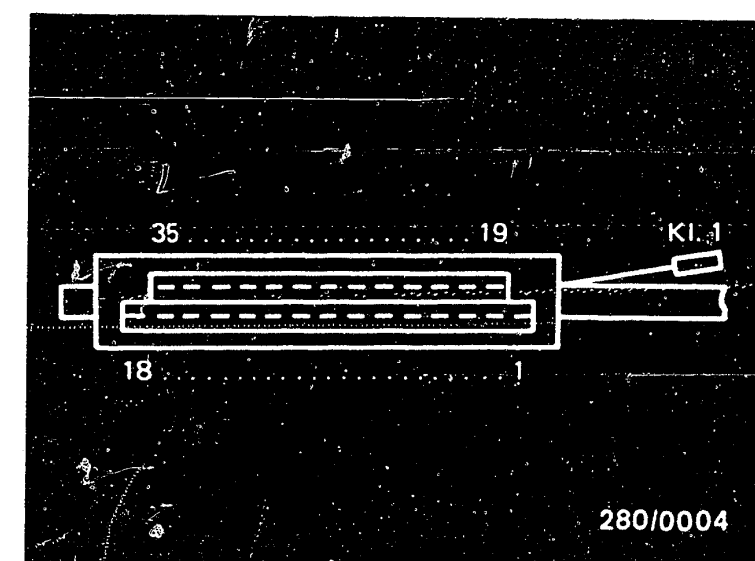
Continued on C9/C10



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C7

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C8

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



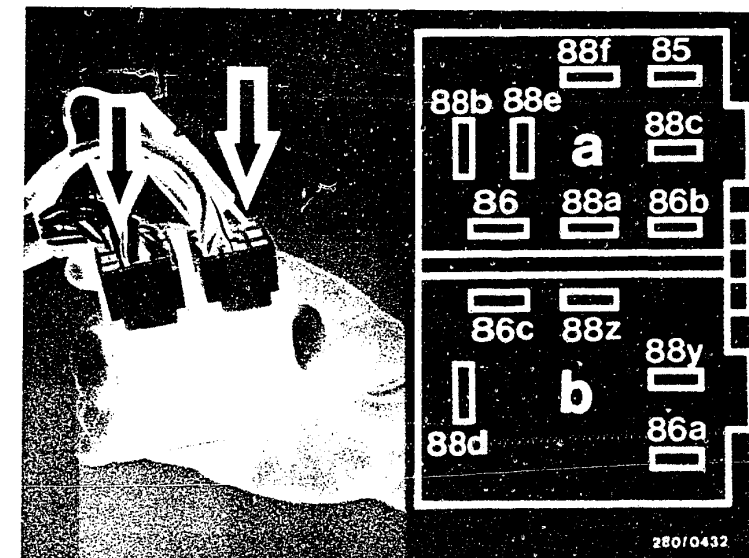
Trouble-shooting (continued)

1. Voltage at relay set term. 88b? If not, replace relay set.
2. Test plug-in connection on 3rd solenoid-operated injection valve. If defective, repair plug-in connection.
3. Voltage at injection valve connector term. 40? If not, test lead from injection valve connector to relay set term. 88b.
4. Test lead 32 from injection valve connector to multiple plug term. 32 for continuity.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

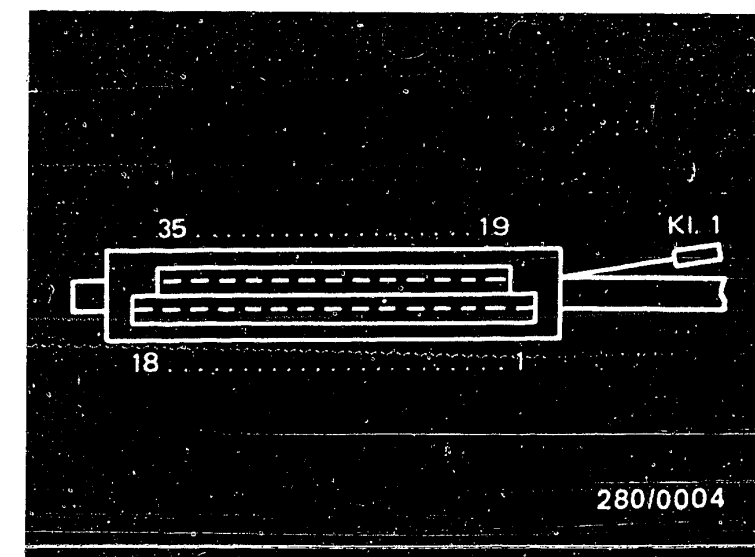
- Relay set: On right-hand spring strut.
- Control unit: Passenger side, in footwell, behind a cover.
- Injection valve: Between intake manifold and engine block.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C9

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé

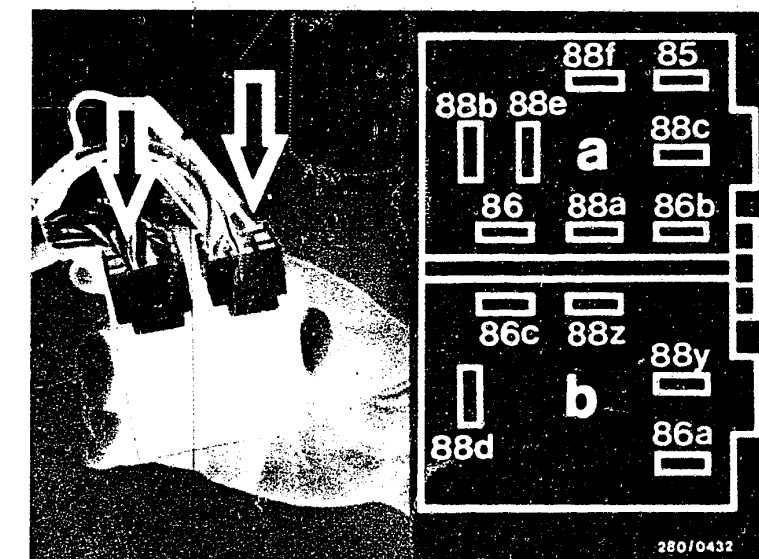


C10

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 8			
Operation		Reading	Testing
<u>Program switch position "V":</u>	10	Multimeter must indicate 8 ... 15 V.	<u>Component:</u> Control unit, Relay set
<u>Program switch position: "S"</u>	-		
<u>Measuring equipment:</u> Multimeter (Volt range)		<div><div>yes</div><div>Continue testing with next test step.</div><div>no</div></div>	<u>Operation:</u> Power supply to 4th solenoid-operated injection valve
<u>Measuring range:</u> 0 ... 15 V			
<u>Connection:</u> Test sockets red (+) and black (-)			
<u>Operation in vehicle:</u> Ignition "ON"			
			<u>Malfunction:</u> No voltage reading



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
KI. 1 = Term. 1

Trouble-shooting:

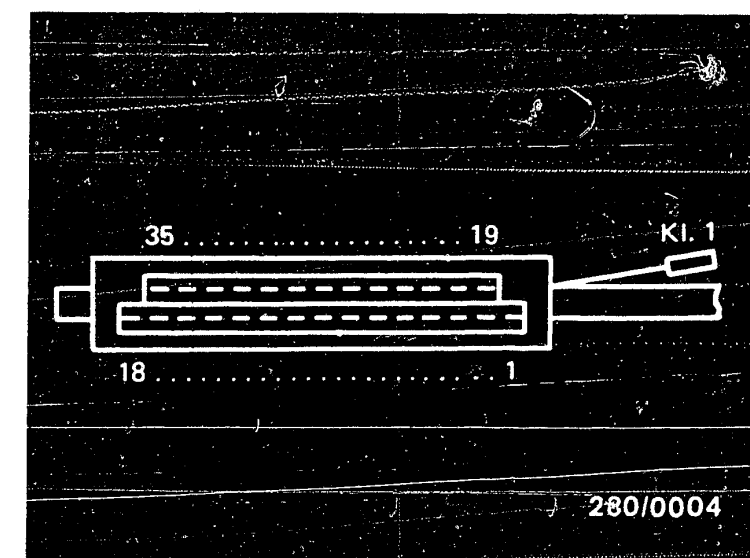
For all voltage measurements:

1. Set value 8 ... 15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω .

Important! Ignition "OFF" and ensure proper electrical connection when measuring.



Continued on C13/C14

C11

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C12

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Trouble-shooting (continued)

1. Voltage at relay set term. 88b? If not, replace relay set.
2. Test plug-in connection at 4th solenoid-operated injection valve. If defective, repair plug-in connection.
3. Voltage at injection valve connector term. 41? If not, test lead from injection valve connector to relay set term. 88b.
4. Test lead 14 from injection valve connector to multiple plug term. 14 for continuity.

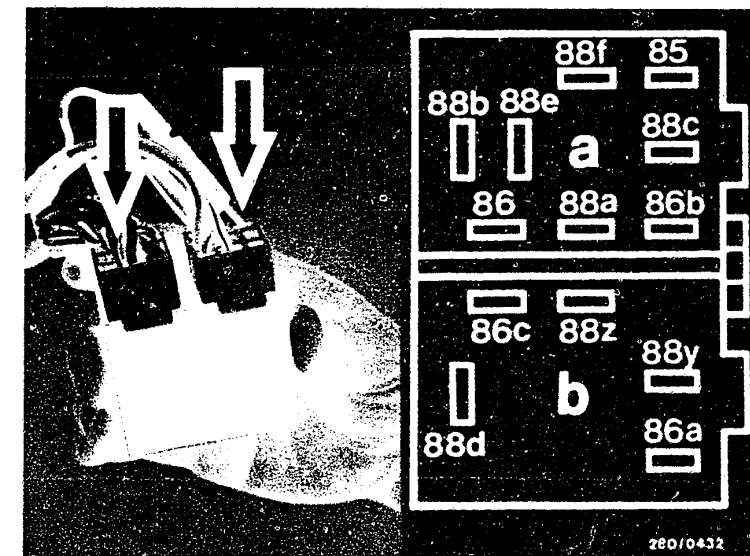
Eliminate contact resistances at the plug-in connections.

Installation position of components:

Relay set: On right-hand spring strut.

Control unit: Passenger side, in footwell, behind a cover.

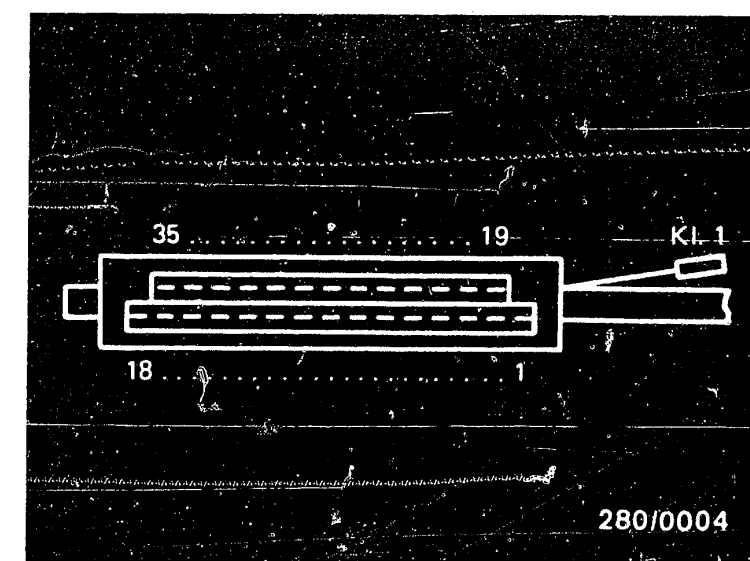
Injection valve: Between intake manifold and engine block.



Measure voltage on back of plug

a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C13

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C14

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 9		
Operation	Reading	Testing
Program switch position "V":	11	Component: Pump contact in air-flow sensor, relay set
Program switch position: "Ω"	-	
Measuring equipment: Multimeter	<div> <div>8 ... 15 V.</div> <div> <div>yes</div> <div>no</div> </div> <div> <div>Continue testing with next test step.</div> </div> </div>	Operation: Power supply to electric fuel pump
Measuring range: 0 ... 15 V		
Connection: Test sockets red (+) and black (-)		Malfunction: No voltage reading
Operation in vehicle: Ignition "ON", deflect air-flow sensor flap		

Trouble-shooting:

For all voltage measurements:

1. Set value 8 ... 15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

Continued on C17/C18

C15

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



C16

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



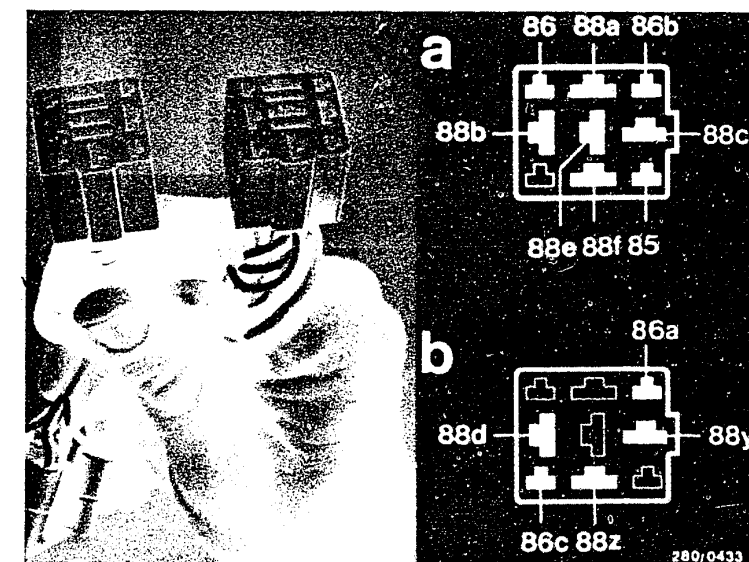
Trouble-shooting (continued)

1. Voltage at air-flow sensor term. 39? If not, remove plug from air-flow sensor and test lead 39.
2. Test pump contact in air-flow sensor (deflect air-flow sensor flap). Test diode in air-flow sensor between term. 6 and term. 36 (positive pole of ohmmeter to term. 6 of air-flow sensor) set value: approx. 0 Ω . With reversed polarity $\infty \Omega$.
3. Test lead 36 between air-flow sensor and relay set.
4. Test lead 20 between control unit and relay set.

Eliminate contact resistances in the plug-in connections.

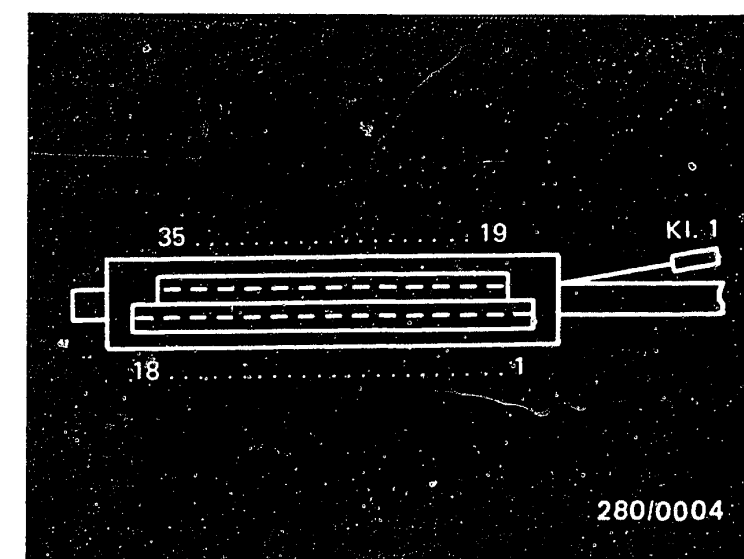
Installation position of components:

- Relay set: On right-hand spring strut.
- Control unit: Passenger side, in footwell, behind a cover.
- Air-flow sensor: Between air filter and intake manifold, on left-hand side.



Relay set removed
Top view of plug
a = Jetronic wiring harness
b = Vehicle wiring harness

Top view of multiple plug
Kl. 1 = Term. 1



C17

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C18

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 10			
Operation		Reading	Testing
Program switch position "V":	12	Multimeter must indicate 8 ... 15 V.	Component: Control unit
Program switch position: "Ω"	-		
Measuring equipment: Multimeter (Volt range)			Operation: Triggering of control unit output stage
Measuring range: 0 ... 15 V			Malfunction: No reading
Connection: Test sockets red (+) and black (-)			
Operation in vehicle: Ignition "ON"		yes ↓ Continue testing with next test step.	
		no ↓	

Trouble-shooting:

For all voltage measurements:

1. Set value 8 ... 15 V (ignition "ON").
2. Make measurement at the respective component plug.
3. The connector remains plugged onto the relay set.

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary use circuit diagram. Set value approx. 0 Ω.

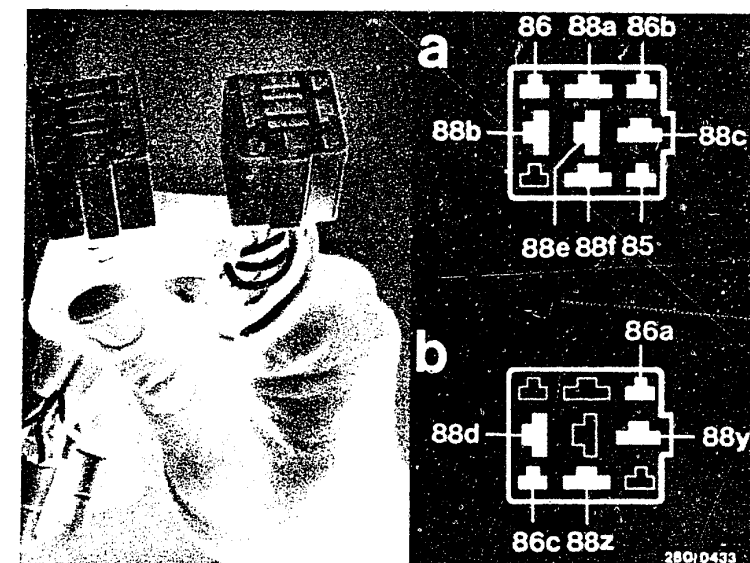
Important! Ignition "OFF" and ensure proper electrical connection when measuring. Test lead from multiple plug term. 29 to relay set term. 88e. If the lead is O.K., but still no reading replace the control unit.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

Relay set: On right-hand spring strut.

Control unit: Passenger side, in footwell, behind a cover.



Relay set removed

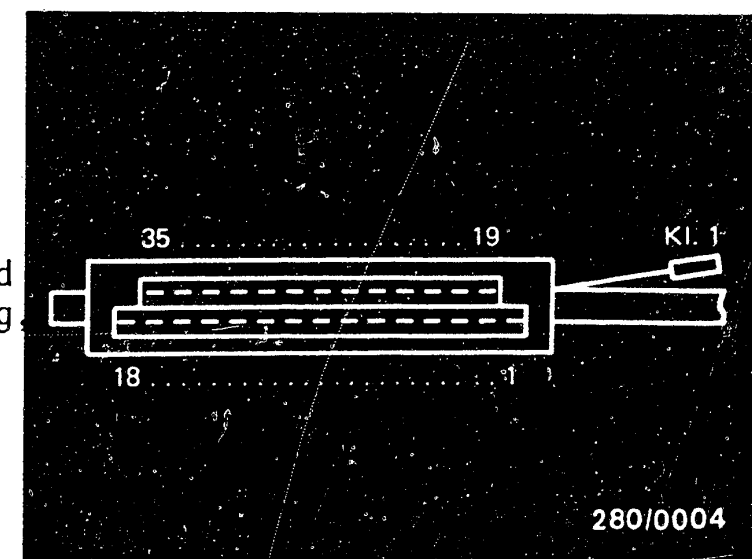
Top view of plug

a = Jetronic wiring harness

b = Vehicle wiring harness

Top view of multiple plug

Kl. 1 = Term. 1



C19

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



C20

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



Test step 11		
Operation	Reading	Testing
Program switch position "V": ↓	Multimeter must indicate	Component: Air-flow sensor (Potentiometer)
Program switch position: "Ω" 6	80 600 Ω	
Measuring equipment: Multimeter (Ω range)		Operation: Resistance between air-flow sensor term. 7 and central ground
Measuring range: x 10 Ω	yes ↓ Continue testing with next test step.	Malfunction: Resistance outside tolerance
Connection: Test sockets blue	no ↓	
Operation in vehicle: Deflect air-flow sensor flap (as far as it will go)		

Trouble-shooting:

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

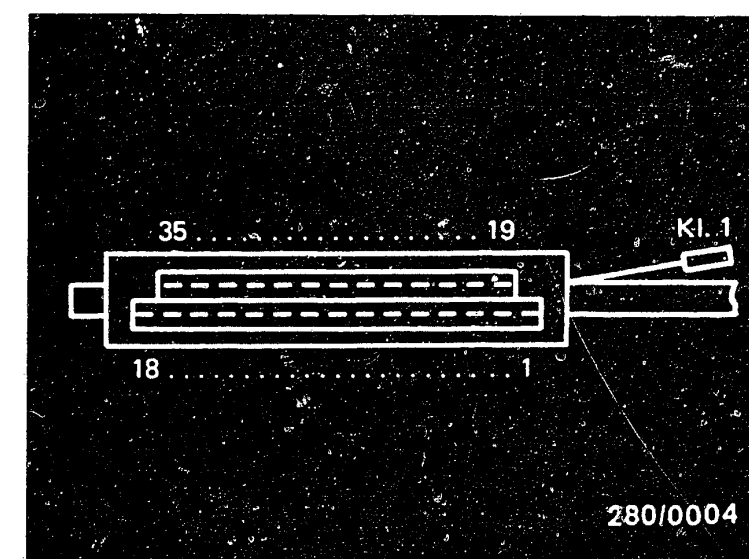
Important! Ignition "OFF" and ensure proper electrical contact when measuring.

From multiple plug term. 7 to air-flow sensor term. 7

From air-flow sensor term. 6 to multiple plug term. 6

From multiple plug term. 5 to central ground.

Eliminate contact resistances in the plug-in connections.



Top view of multiple plug

KL. 1 = Term. 1

Installation position of components:

Control unit:

Passenger side, in footwell, behind a cover.

Air-flow sensor:

In engine compartment on left-hand side, between air filter and intake manifold.

Central ground:

Between air filter and air-flow sensor, on left-hand side of engine block.

C21

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



C22

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 12		
Operation		Reading
Program switch position "V":	↓	Multimeter must indicate 260 ... 520 Ω
Program switch position: "Ω"	7	
Measuring equipment: Multimeter (Ω range)		<div> <div></div> <div>yes</div> <div>Continue testing with next test step.</div> </div> <div>no</div>
Measuring equipment: x 10 Ω		
Connection: Test sockets blue		<div> <div></div> <div>no</div> </div>
Operation in vehicle:		

Trouble-shooting:

For resistance measurements:

For testing, remove wiring-harness plug from test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

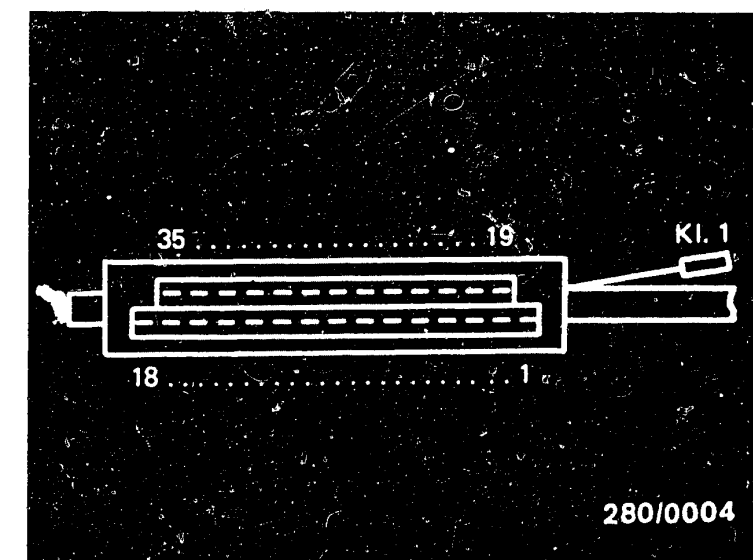
Important! Ignition "OFF" and ensure proper electrical connection when measuring.

From multiple plug term. 8 to air-flow sensor term. 8

From air-flow sensor term. 6 to multiple plug term. 6

From multiple plug term. 5 to central ground.

Eliminate contact resistances in the plug-in connections.



Top view of multiple plug.

Kl. 1 = Term. 1

Installation position of components:

Control unit:

Passenger side, in footwell, behind a cover.

Air-flow sensor:

In engine compartment on left-hand side, between air filter and intake manifold.

Central ground:

Between air filter and air-flow sensor, on left-hand side of engine block.

C23

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé




C24

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



Test step 14			
Operation		Reading	Testing
Program switch position "V":		Multimeter must indicate	Component: Throttle-valve switch (Idle contact)
Program switch position: "Ω"	9	<u>0...10 Ω.</u>	
Measuring equipment: Multimeter (Ω range)		<div><div>yes</div><div>no</div></div>	Operation: Resistance at throttle-valve switch between term. 2 and term. 18
Measuring range: x 1 Ω			
Connection: Test sockets blue			Malfunction: Resistance outside tolerance
Operation in vehicle: Accelerator in rest position			

Trouble-shooting:

For resistance measurements:

For testing, remove wiring-harness plug from test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical connection when measuring.

From multiple plug term. 2 to throttle-valve switch term. 2

From throttle-valve switch term. 18 to multiple plug term. 18

Eliminate contact resistances in the plug-in connections.

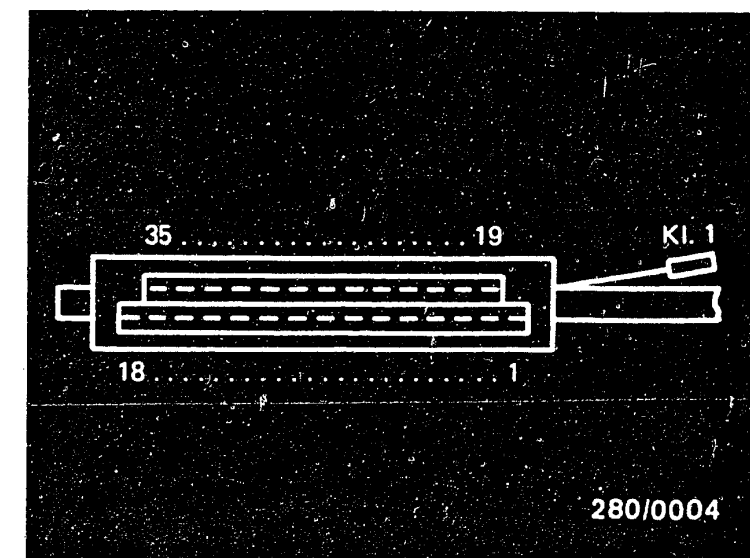
Adjusting the throttle-valve switch (only for 0 280 120 300):

Loosen the fastening screws of the throttle-valve switch slightly.

Connect ohmmeter to throttle-valve switch between term. 2 and 18. Turn the throttle-valve switch to the right until the idle contact (microswitch) can be heard to click (reading 0 Ω).

Checking the adjustment: Pull on the throttle cable slightly (open throttle valve slightly).

The idle contact must be heard to click (reading ∞ Ω).



Top view of multiple plug

Kl. 1 = Term. 1

Installation position of components:

Throttle-valve switch:

In right-hand side of engine compartment on throttle-valve assembly.

Control unit:

Passenger side, in footwell, behind a cover.

D3

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



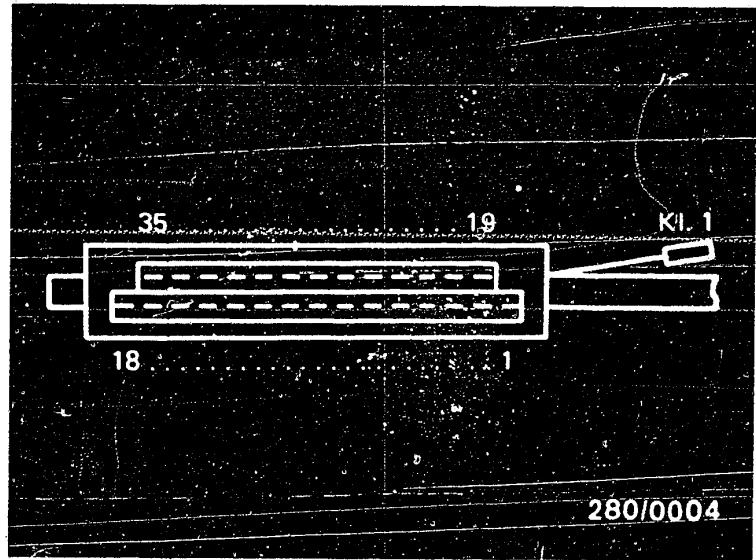
D4

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



Test step 18		
Operation	Reading	Testing
Program switch position "V": ↓	Multimeter must indicate	Component: Ground connection of output stage
Program switch position: "Ω" 13	0...10 Ω.	
Measuring equipment: Multimeter (Ω range)		Operation: Ground connection of control unit
Measuring range: x 1 Ω	yes ↓ Continue testing with next test step.	Malfunction: Resistance outside tolerance
Connection: Test sockets blue	no ↓	
Operation in vehicle: _____		



Top view of multiple plug
Kl. 1 = Term. 1

Trouble-shooting:

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0 Ω.

Important! Ignition "OFF" and ensure proper electrical contact when measuring.

From multiple plug term. 16 to central ground.

From multiple plug term. 5 to central ground.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

Control unit: Passenger side, in footwell, behind a cover.

Central ground: Between air filter and air-flow sensor, on left-hand side of engine block.

D11

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé




D12

Test chart for universal test adapter
Lancia Beta, Trevi, HPE, Coupé



Test step 19

Operation		Reading	Testing
Program switch position "V":		Multimeter must indicate	Component:
Program switch position: "Ω"	14	<u>0...10 Ω.</u>	Ground connection of output stage
Measuring equipment: Multimeter (Ω range)			Operation:
Measuring range: x 1 Ω			Ground connection of control unit
Connection: Test sockets blue		yes ↓ Conduct fuel pressure test	Malfunction: Resistance outside tolerance
Operation in vehicle: _____		no ↓	

Trouble-shooting:

For resistance measurements:

For testing, remove wiring-harness plug from the test adapter and, if necessary, use circuit diagram. Set value approx. 0Ω .

Important! Ignition "OFF" and ensure proper electrical contact when measuring.

From multiple plug term. 17 to central ground.

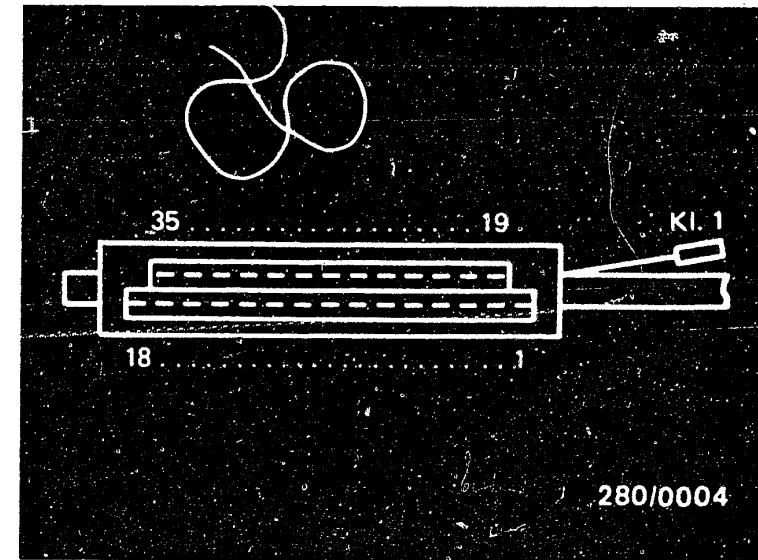
From multiple plug term. 5 to central ground.

Eliminate contact resistances at the plug-in connections.

Installation position of components:

Control unit: Passenger side, in footwell, behind a cover.

Central ground: Between air filter and air-flow sensor, on left-hand side of engine block.



Top view of multiple plug

K1. 1 = Term. 1



Testing with the universal test adapter is now completed.

The fuel pressure test must now be performed.
If a fault is found during a test, the test must be repeated after the fault has been eliminated.

The fuel pressure test is described on Coordinates D16 ... E 2.

D 15

Test chart for universal test adapter

Lancia Beta, Trevi, HPE, Coupé



FUEL PRESSURE TEST

Fuel pump operating? (Listen)
Relay set O.K.?

no

1. Test relay set.
For testing, screw off relay set and turn round so that connection bases are accessible from below.

Test voltage supply. Switch on ignition. Using voltmeter, measure battery voltage at term. 88z, 88b, 88e and 88a to vehicle ground. If no voltage, test connecting leads. If leads O.K.

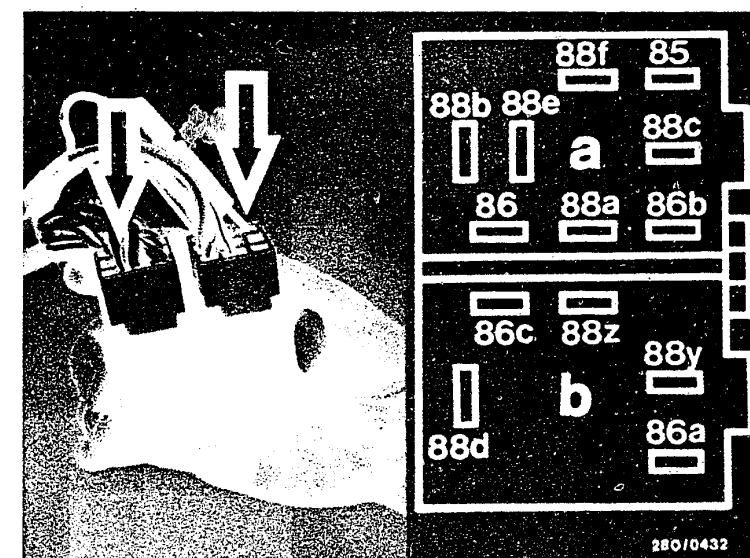
2. Test resistance at relay set between term. 86b (connection of positive pole) and term. 85:
70...500 Ω

Test O.K.? →

3. Start engine. Test voltage at disconnected pump plug (set value min. 12 V).
If no voltage:
Test voltage at pump fuse (on right-hand side in engine compartment on right-hand spring strut, near to relay set). and relay set term. 88y and 88d.
Voltage on term. 88y → replace pump fuse.
If no voltage on term. 88d → replace relay set.

yes

Continued on D18/D19

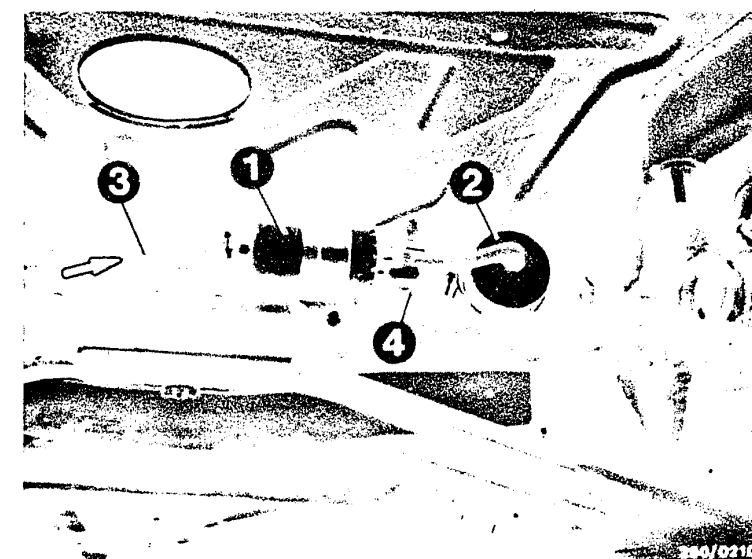


Measure voltage on back of plug

a = Jetronic wiring harness

b = Vehicle wiring harness

1 = Fuel pump



D16

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



D17

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



Fuel pressure test (continued)

yes

Fuel pressure O.K.?

Test specification

2,8...3,2 bar

Test specification reached?

yes

Continued on D22/D23

Ground connection of fuel pump O.K.?

If not, test ground terminal and ground lead for open circuit and proper connection.

The ground terminal is situated in luggage compartment above wheel, to right-hand side on a ground point.

Fuel pump operating?

If not, start engine, test voltage at disconnected pump plug (set value min. 12 V).

If voltage present, replace fuel pump.

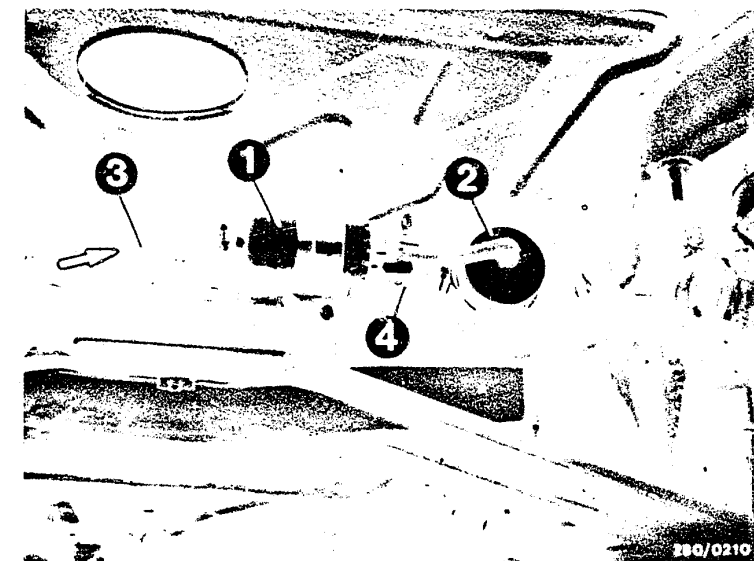
no

Testing: Remove hose from start valve. Connect pressure gauge.

Caution: When removing the fuel hose make sure that no fuel gets onto hot parts of the engine.

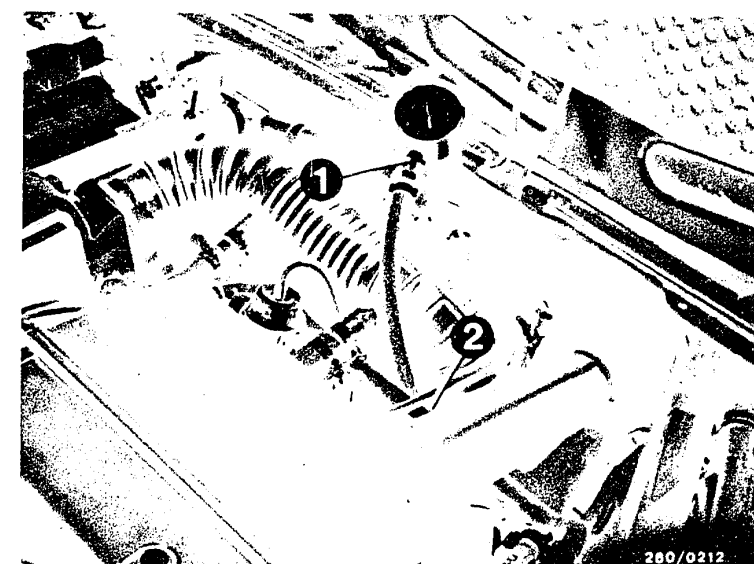
yes

Continued on D20/D21



1 = Electric fuel pump

1 = Pressure gauge
2 = Connection to start valve



D 18

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



D 19

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



Fuel pressure test (continued)

Testing the fuel pressure

Connect the connections of the pressure testers into the fuel delivery line on the start valve. If using pressure tester KDJE-P 100, close the hollow screw. Plug the end of the hose onto the start valve, and plug the Y-piece onto the hose to the fuel-distribution pipe.

Make sure there are no leaks.

Remove the hose between air filter and air-flow sensor. Switch on ignition. Slightly deflect air-flow sensor flap. (Pump contact must close).

Fuel pump must operate.

Fuel pump pressure

2.8...3.2 bar

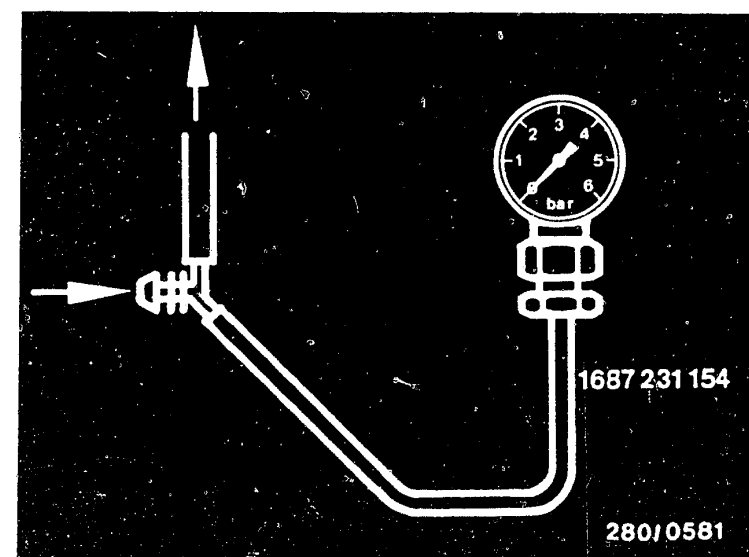
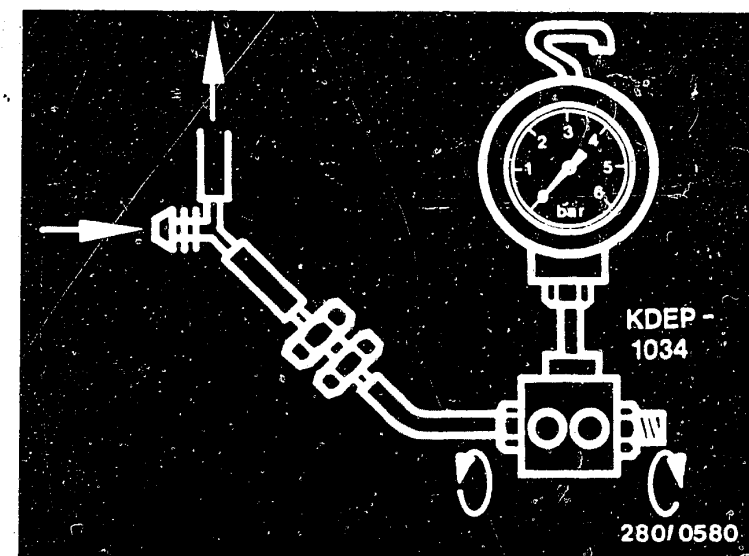
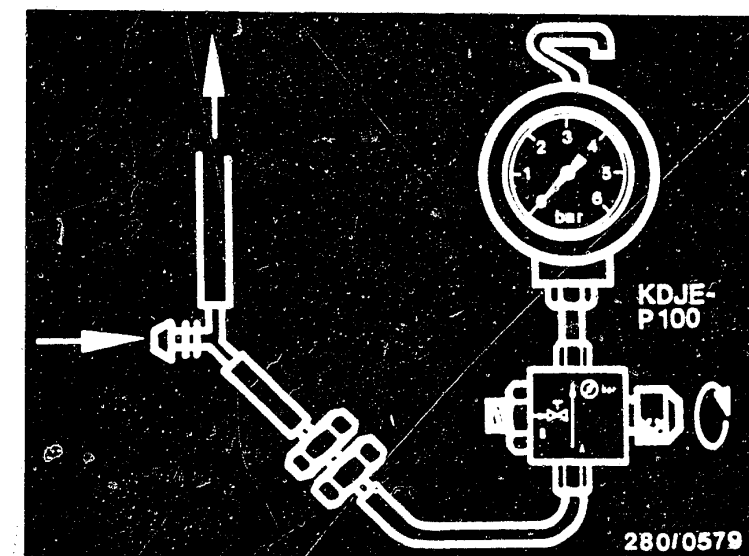
Let engine idle →

Fuel pump pressure approx. 2.5 bar

yes

yes

Continued on D22/D23



D20

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



D21

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



Fuel pressure test (continued)

Fuel pressure O.K.?

Test specification

2.8...3.2 bar

Pressure regulator O.K.?
Test specification reached?

no

Testing the pressure regulator

Remove hose between air filter and air-flow sensor. Switch on ignition. Slightly deflect air-flow sensor flap (pump contact must close). Electric fuel pump must operate.

Fuel pump pressure

2.8...3.2 bar

Fuel pressure of 2.8 bar not reached:

1. Slowly pinch off fuel return line: (caution: do not load pressure gauge above 6 bar).
Pressure rises above 4 bar → replace pressure regulator.
Pressure remains below 4 bar → replace electric fuel pump.
2. Check fuel delivery line and fuel filter for throughflow.
3. Strainer in tank clogged.
4. Corrosion in tank.

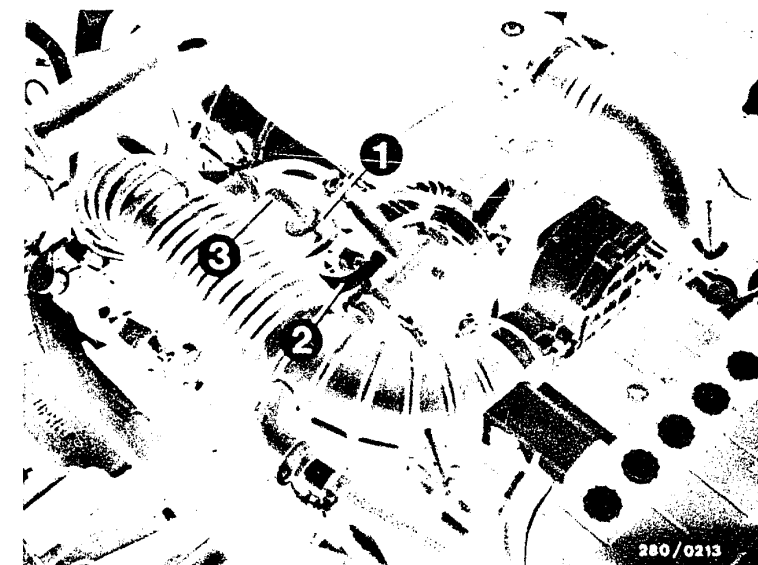
Fuel pressure of 3.2 bar exceeded:

1. Fuel return line clogged or pinched.
2. Replace pressure regulator.

After testing is completed, refit hose between air filter and air-flow sensor.

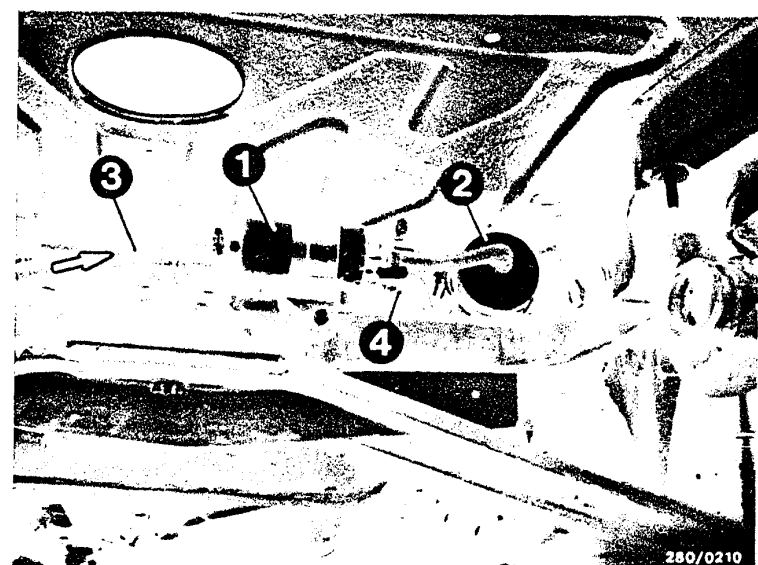
yes

Continued on E1/E2



- 1 = Pressure regulator
- 2 = Fuel distribution pipe
- 3 = Air hose to intake manifold

- 1 = Fuel pump
- 2 = Fuel filter
- 3 = Fuel intake line
- 4 = Fuel delivery line
- Arrow = Fuel flow direction



D22

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



D23

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



Fuel pressure test (continued)

Does fuel pressure remain constant after the engine has started?

no

Test fuel pump contact in air-flow sensor:

Dismantle hose between air filter and air-flow sensor. Remove plug.

Connect ohmmeter to term. 36 and term. 39 of the air-flow sensor.

Push air-flow sensor flap open manually.

Indicator must switch from $\infty \Omega$ to 0Ω .

If not, replace air-flow sensor.

Replace hose between air filter and air-flow sensor and screw tight.

Test for leaks.

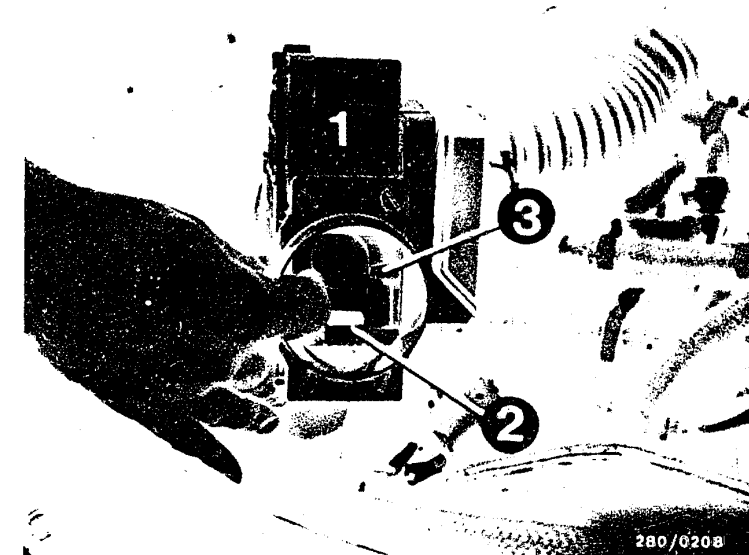
yes

The fuel pressure test is now completed.

If the fault has not been found or if you require further information and instructions on how to remedy the fault, continue with the trouble-shooting program of your choice.

Detailed trouble-shooting → see B 3

Direct trouble-shooting → see B 5



1 = Air-flow sensor

2 = Stopper

3 = Temperature sensor I

E1

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



E2

Fuel pressure test

Lancia Beta, Trevi, HPE, Coupé



STARTING MOTOR OPERATES, ENGINE FAILS TO START OR STARTS ONLY WITH GREAT DIFFICULTY

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

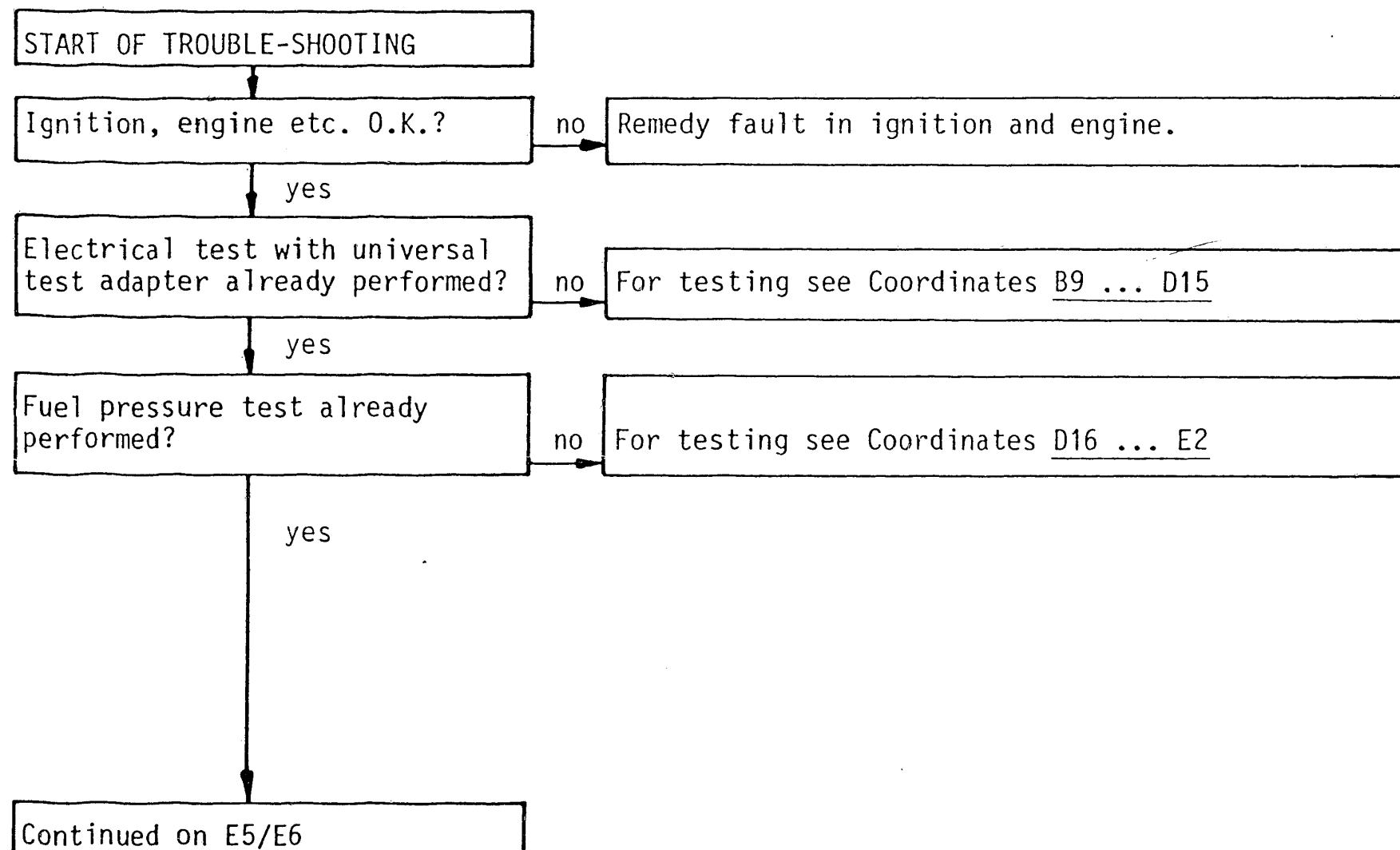
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



E3

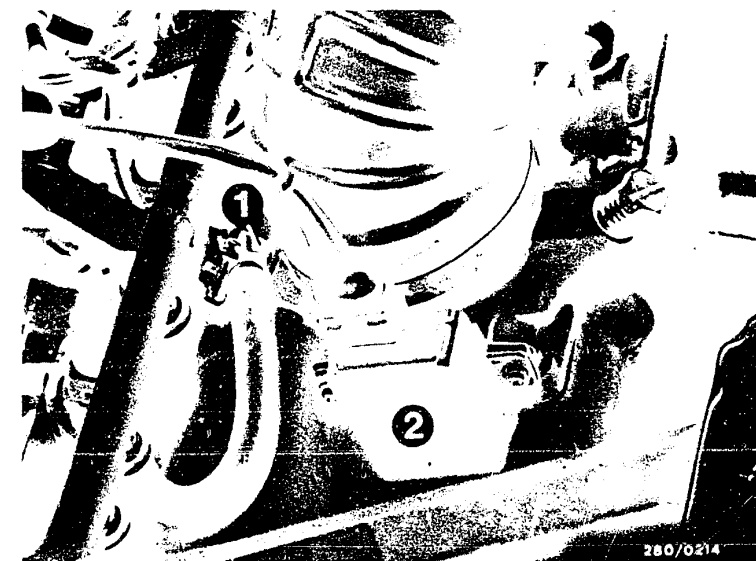
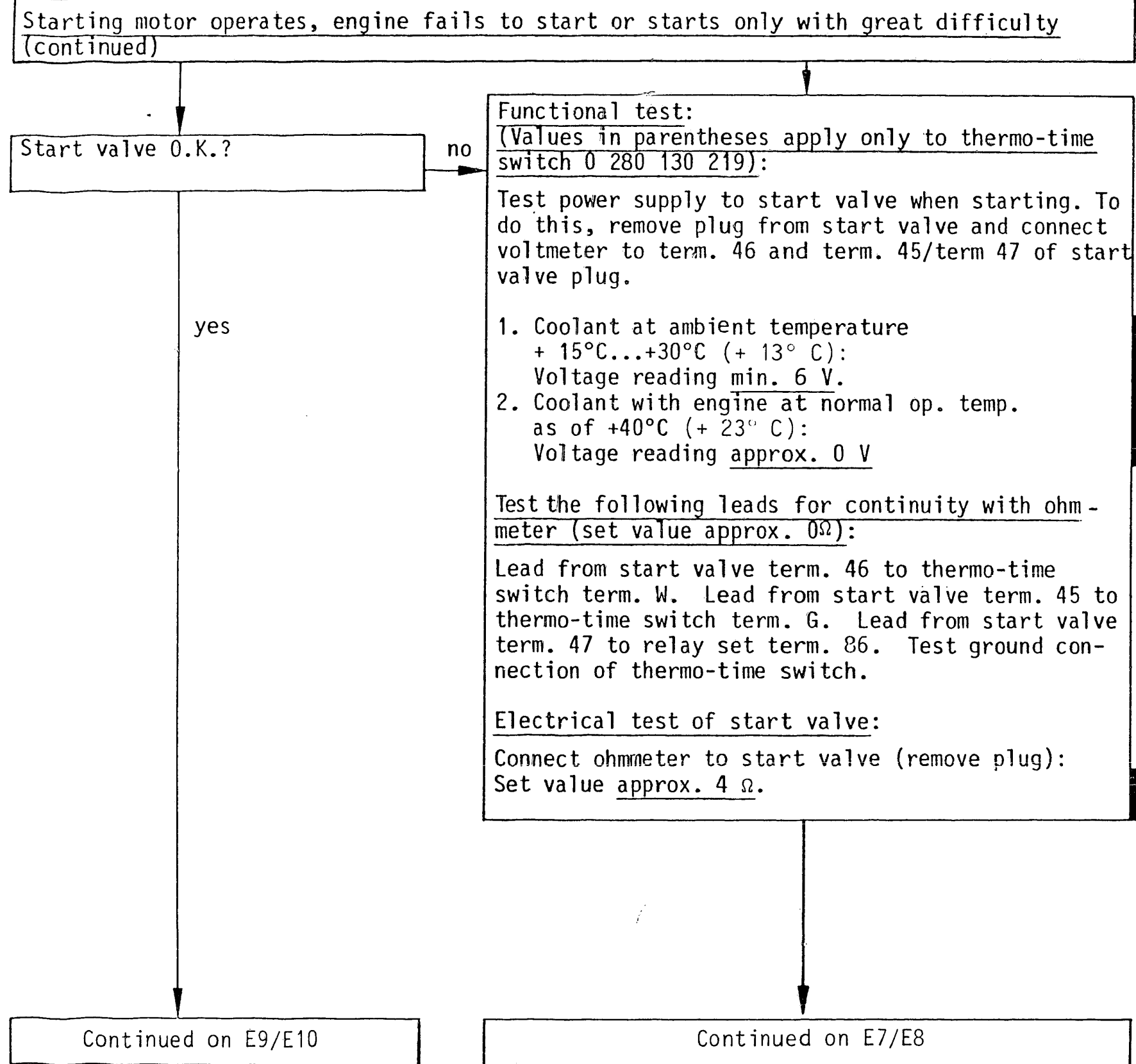
Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E4

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé





1 = Start valve
(blue plug)
2 = Throttle-valve switch

1 = Temperature sensor II
(white plug)
2 = Thermo-time switch
(brown plug)
3 = Auxiliary-air device



E5

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E6

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Mechanical test of start valve:

Remove start valve from intake manifold and hold in a container. (Caution! Fire hazard!). When starting at an ambient temperature below $+30^{\circ}\text{C}$ ($+13^{\circ}\text{C}$) the start valve must squirt (max. 8 sec). With the engine at normal operating temperature above $+40^{\circ}\text{C}$ ($+23^{\circ}\text{C}$) the start valve must not squirt. With the ignition switched on and the pressure built up the start valve must likewise not squirt. Carry out squirt test for above $+40^{\circ}\text{C}$ ($+23^{\circ}\text{C}$) as follows: Remove plug from thermo-time switch and ground term. W.

Testing the start valve for leaks:

1. When installed: Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.
2. When removed: Remove start valve (Caution! Fire hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (unscrew hose between air filter and air-flow sensor. Ignition on, and deflect air-flow sensor flap). Test specification: within one minute max. 1 drop may form at the mouth of the valve. Caution! After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on E9/E10

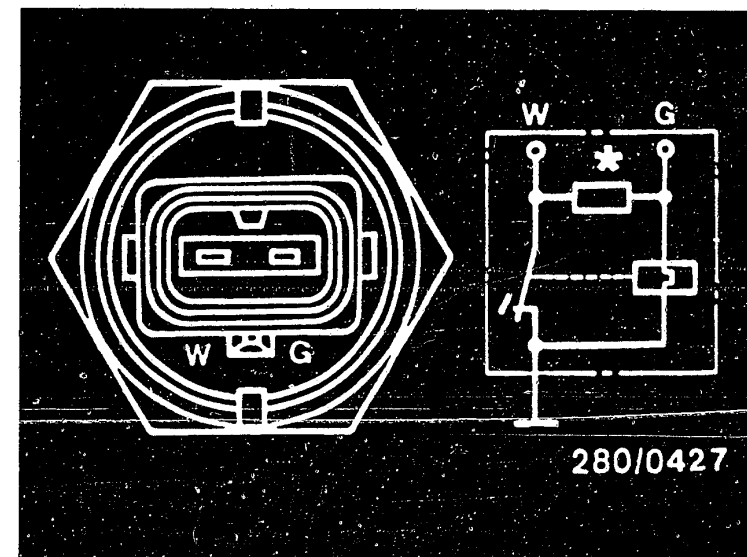
E7

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E8

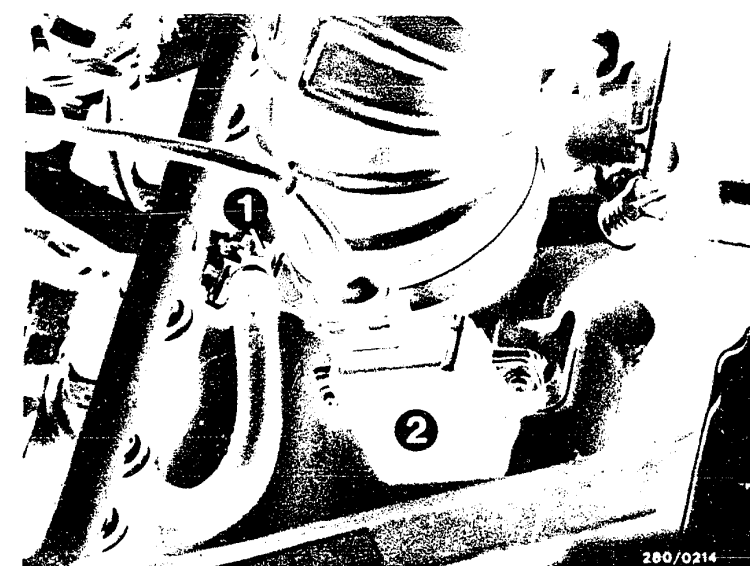
Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Thermo-time switch

* Resistor not applicable for
0 280 130 221

- 1 = Start valve
(blue plug)
2 = Throttle-valve switch



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Thermo-time switch O.K.?

no

Electrical test

Test the thermo-time switch as follows:
Disconnect plug and make direct resistance
measurement at thermo-time switch using ohmmeter:

Thermo-time switch 0 280 130 214 (35°/8 sec.)

measured between term. "G" and ground

Ambient temperature
(below + 30°C): 25...40 Ω

Normal operating engine
temperature (above + 80°C): 50...80 Ω

measured between term. "W" and ground

Ambient temperature
(below + 30°C): 0 Ω

Normal operating engine
temperature (above + 80°C): 100...160 Ω

measured between term. "G" and "W"

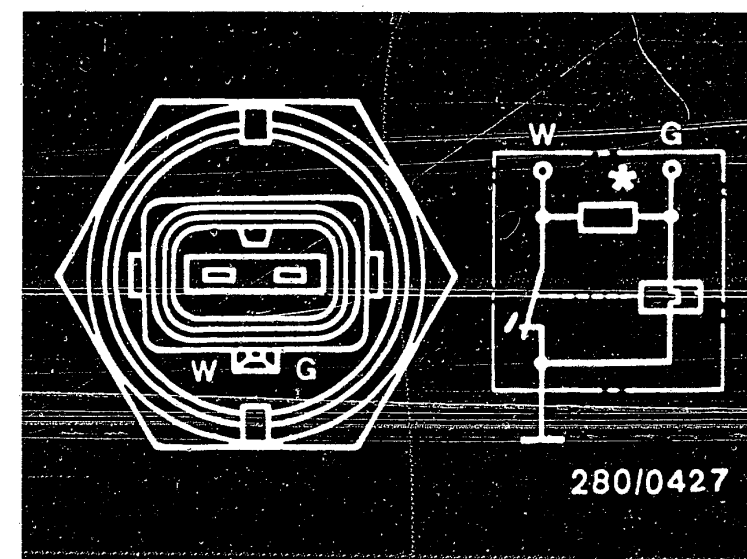
Ambient temperature
(below + 30°C): 25...40 Ω

Normal operating engine
temperature (above + 80°C): 50...80 Ω

yes

Continued on E13/E14

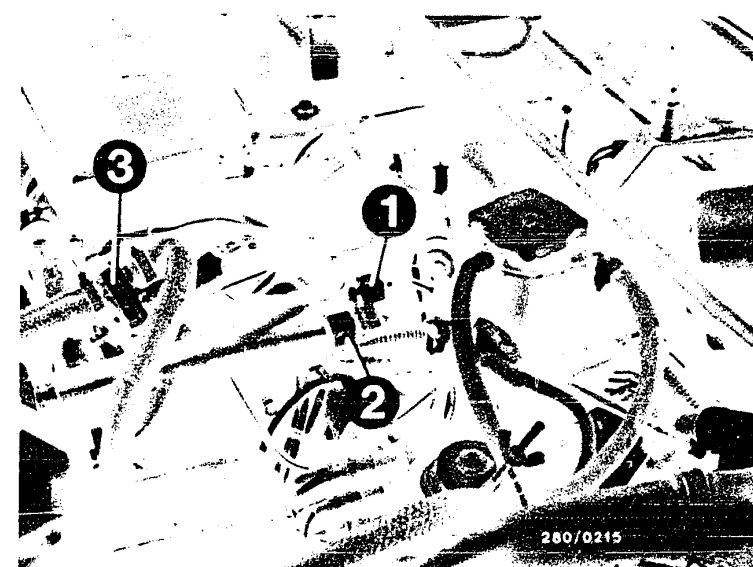
Continued on E11/E12



Thermo-time switch

* Resistor not applicable for
0 280 130 221

- 1 = Temperature sensor II
(white plug)
- 2 = Thermo-time switch
(brown plug)



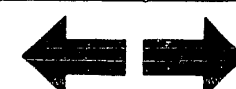
E9

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E10

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

yes

Thermo-time switch 0 280 130 221
(18° / 8 sec.)

measured between term. "G" and ground

Ambient temperature
(below + 13°C): 50...70 Ω

Ambient temperature
(above + 23°C): 50...70 Ω

measured between term. "W" and ground

Ambient temperature
(below + 13°C): 0 Ω

Ambient temperature
(above + 23°C): ∞ Ω

measured between term. "G" and "W"

Ambient temperature
(below + 13°C): 50...70 Ω

Ambient temperature
(above + 23°C): ∞ Ω

Continued on E13/E14

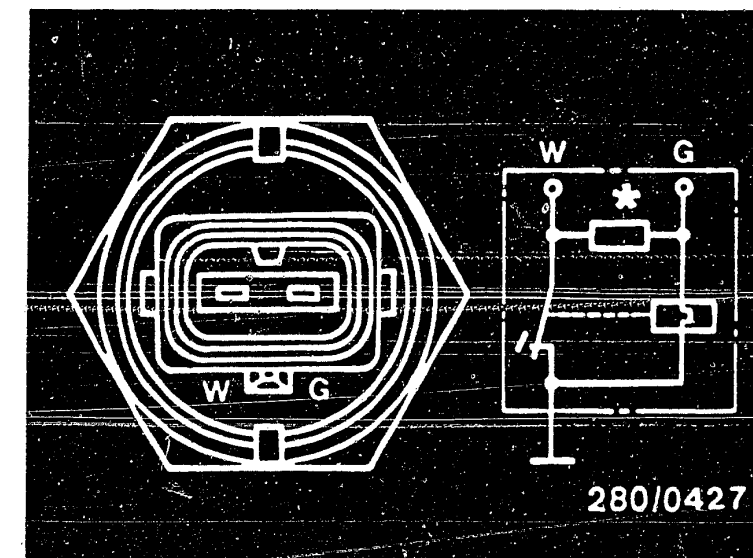
E11

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E12

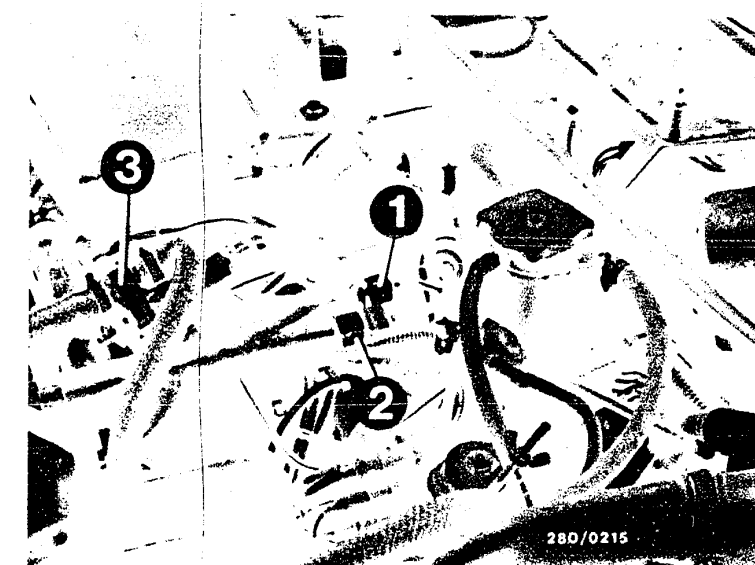
Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Thermo-time switch

* Resistor not applicable for
0 280 130 221

- 1 = Temperature sensor II
(white plug)
- 2 = Thermo-time switch
(brown plug)



Starting motor operates, engine fails to start or starts only with great difficulty
(continued)

Auxiliary-air device tested?
(mechanically O.K.?)

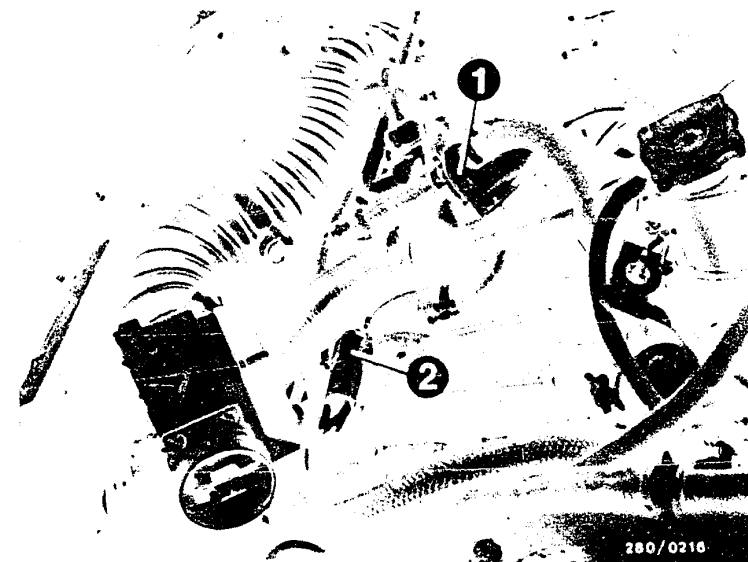
no

Testing:

1. Visual examination of auxiliary-air device.
When cold, the device must be opened; when the engine is warm, it must be closed. If not, replace auxiliary-air device. (Remove hoses and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With the engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop. If incorrect, replace auxiliary-air device (pay attention to direction of flow).

yes

Continued on E15/E16



1 = Auxiliary-air device
2 = Solenoid-operated air valve

E13

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E14

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Starter motor operates, engine fails to start or starts only with great difficulty
(continued)

Temperature sensors tested?

no

Testing:

Temperature sensor I measures the intake air temperature and is located in the air duct of the air-flow sensor. Measure the following values between term. 27 and term. 6 of air-flow sensor:

1. At ambient temperature (approx. +15°C...+30°C):
 $1.45 \dots 3.3 \text{ k } \Omega$
2. With engine at normal op. temp. (approx. +80°C):
 $280 \dots 360 \text{ } \Omega$

Make direct resistance measurement at temperature sensor II (engine) using ohmmeter. Resistance measurement at term. 13 and term. 49 (ground):

1. At ambient temperature (approx. +15°C...+30°C):
 $1.30 \dots 3.6 \text{ k } \Omega$
2. With engine at normal op. temp. (approx. +80°C):
 $250 \dots 390 \text{ } \Omega$

If incorrect, check for open circuit or short circuit in the following leads using ohmmeter:

Temperature sensor I:

- From multiple plug term. 27 to air-flow sensor term. 27.
- From air-flow sensor term. 6 to multiple plug term. 6.

Temperature sensor II

- From multiple plug term. 13 to temperature sensor II term. 13.
- From temperature sensor II term. 49 to central ground (lead 49).

Test all contacts in plug connections.

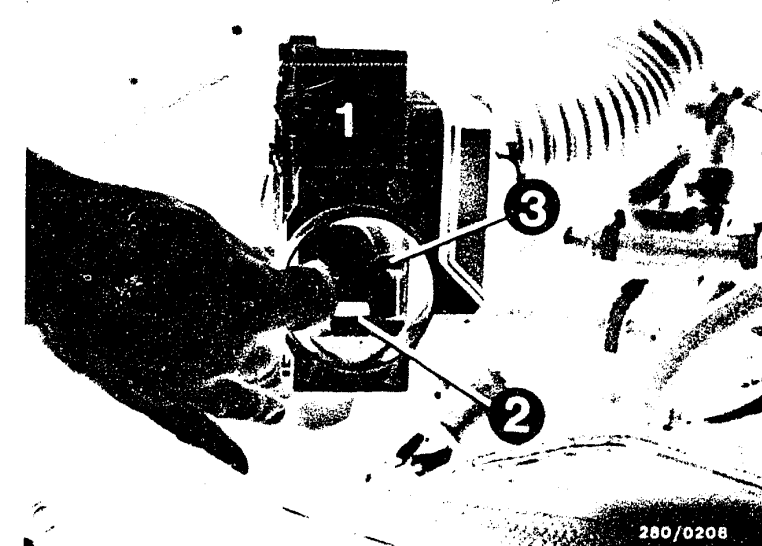
yes

Continued on E17/E18



- 1 = Temperature sensor II (white plug)
2 = Thermo-time switch (brown plug)
3 = Auxiliary-air device

- 1 = Temperature sensor I in air-flow sensor (intake passage)
2 = Stopper
3 = Temperature sensor II



E15

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E16

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Starter motor operates, engine fails to start or starts only with great difficulty
(continued)

Air-flow sensor O.K.?

no

Testing

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

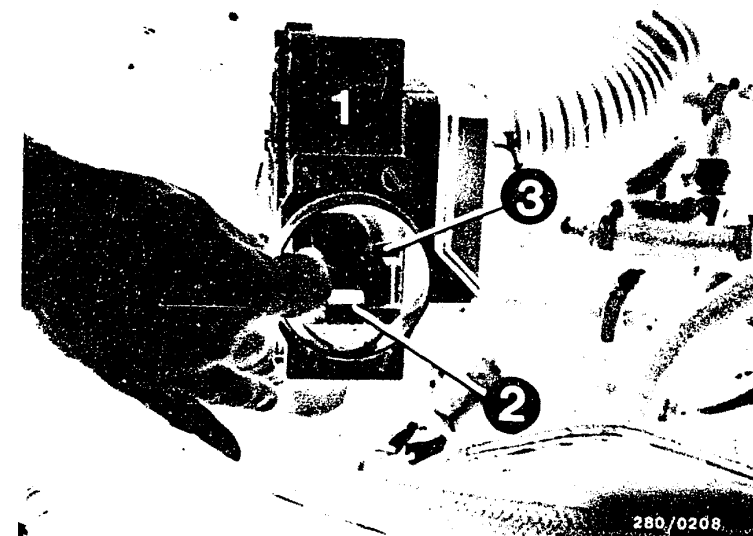
Test specification: $200 \dots 1000 \Omega$

Caution!

After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on E19/E20



1 = Air-flow sensor

E17

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E18

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



Starter motor operates, engine fails to start or starts only with great difficulty
(continued)

Are all hose lines and electric leads securely connected? Visual examination.
Is the air-intake system leak-tight?

no

Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks by using new seals or by re-tightening the connecting screws.

Leak test:

Seal off the exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off the connection port on the auxiliary-air device. Open the throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose contacts.

yes

Testing completed for customer complaint

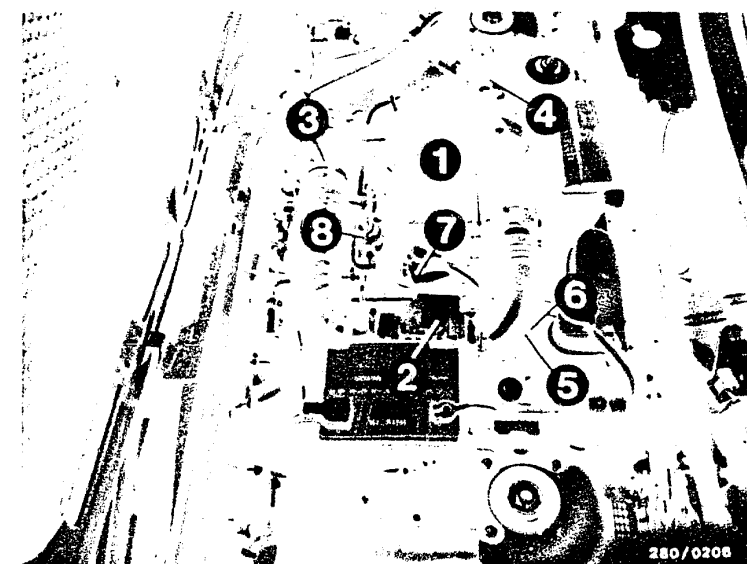
"Starting motor operates, engine fails to start"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).



- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Relay set
- 5 = Thermo-time switch (brown plug)
- 6 = Temperature sensor II (engine) (white plug)
- 7 = Auxiliary-air device (black plug)
- 8 = Pressure regulator

E19

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



E20

Starter turns, engine fails to start
Lancia Beta, Trevi, HPE, Coupé



ENGINE STARTS BUT THEN DIES

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

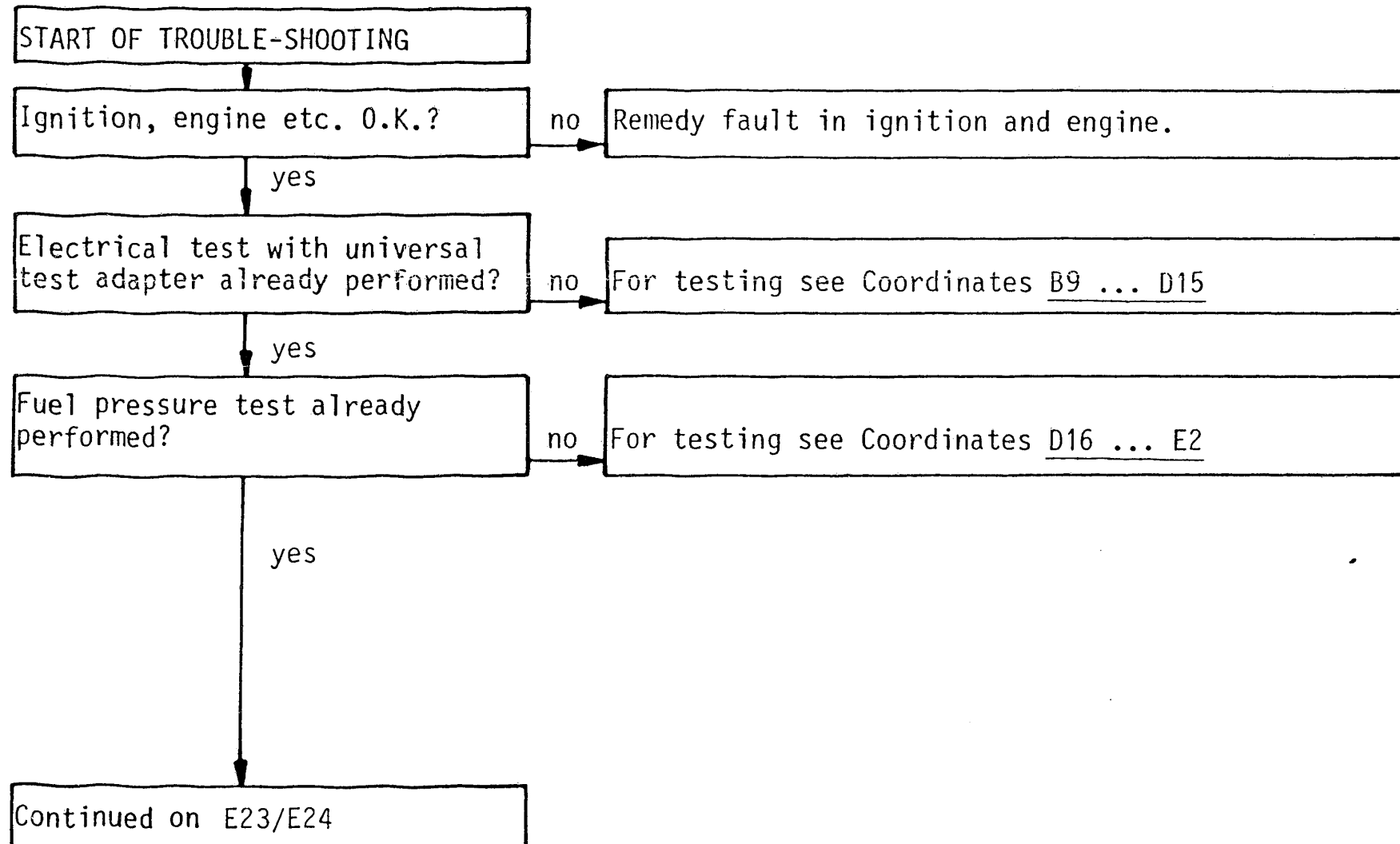
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



E21

Engine starts but then dies

Lancia Beta, Trevi, HPE, Coupé



E22

Engine starts but then dies

Lancia Beta, Trevi, HPE, Coupé



Engine starts but then dies (continued)

Start valve O.K.?

no

Testing the start valve for leaks:

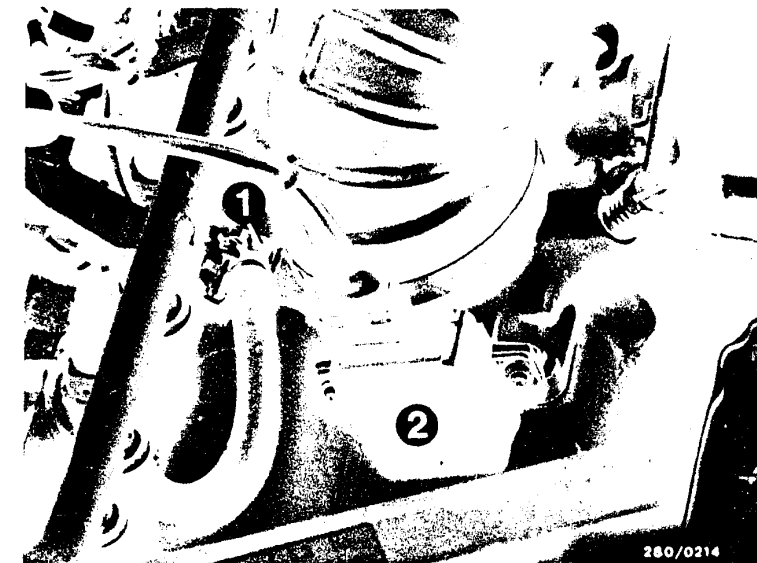
1. When installed: Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.
2. When removed: Remove start valve (Caution! Fire hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (unscrew hose between air filter and air-flow sensor. Ignition on, and deflect air-flow sensor flap).

Test specification: within one minute max. 1 drop may form at the mouth of the valve.

Caution! After testing is completed, rerit the hose between air filter and air-flow sensor.

yes

Continued on F1/F2



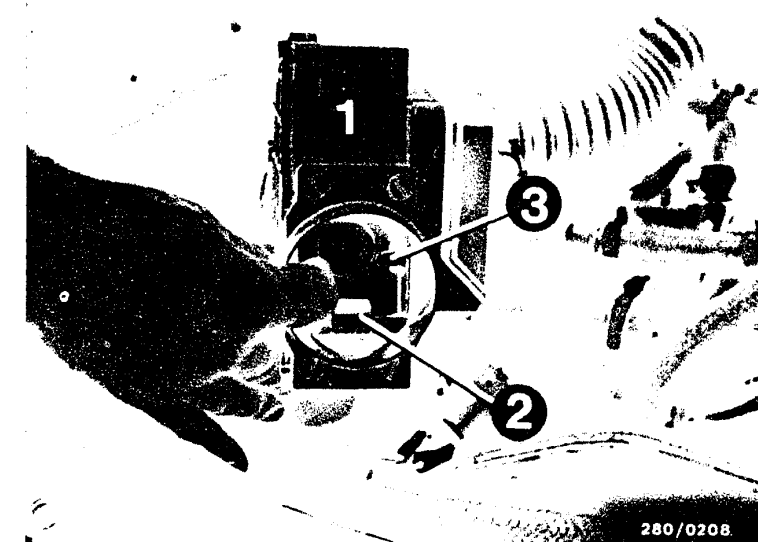
1 = Start valve
(blue plug)

2 = Throttle-valve switch

1 = Air-flow sensor

2 = Stopper

3 = Temperature sensor I



E23

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



E24

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



Engine starts but then dies (continued)

Auxiliary-air device tested?
(mechanically O.K.?)

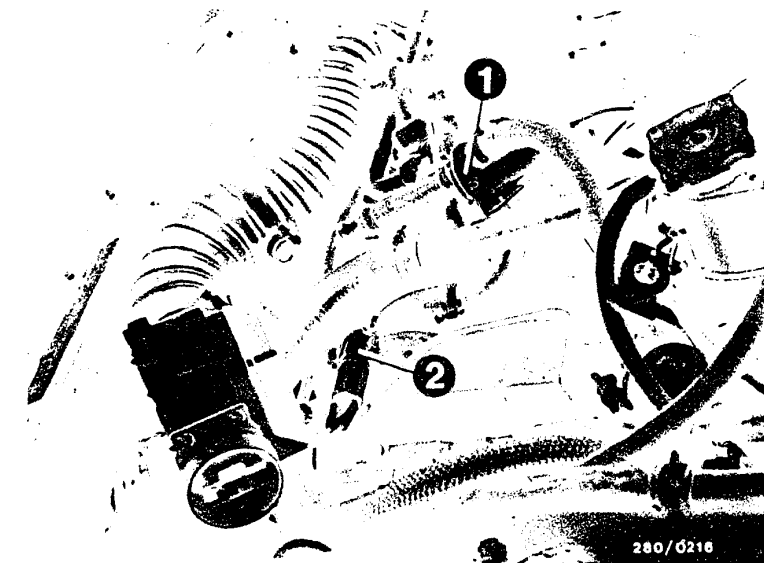
no

Testing:

1. Visual examination of auxiliary-air device.
When cold, the device must be opened; when the engine is warm, it must be closed. If not, replace auxiliary-air device. (Remove hoses and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With the engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop. If incorrect, replace auxiliary-air device (pay attention to direction of flow).

yes

Continued on F3/F4



- 1 = Auxiliary-air device
2 = Solenoid-operated air valve

F1

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



F2

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



Engine starts but then dies (continued)

Temperature sensors tested?

no

Testing:

Temperature sensor I measures the intake air temperature and is located in the air duct of the air-flow sensor. Measure the following values between term. 27 and term. 6 of air-flow sensor:

1. At ambient temperature (approx. $+15^{\circ}\text{C} \dots +30^{\circ}\text{C}$):
 $1.45 \dots 3.3 \text{ k } \Omega$
2. With engine at normal op. temp. (approx. $+80^{\circ}\text{C}$):
 $280 \dots 360 \Omega$

Make direct resistance measurement at temperature sensor II (engine) using ohmmeter. Resistance measurement at term. 13 and term. 49 (ground):

1. At ambient temperature (approx. $+15^{\circ}\text{C} \dots +30^{\circ}\text{C}$):
 $1.30 \dots 3.6 \text{ k } \Omega$
2. With engine at normal op. temp. (approx. $+80^{\circ}\text{C}$):
 $250 \dots 390 \Omega$

If incorrect, check for open circuit or short circuit in the following leads using ohmmeter:

Temperature sensor I:

- From multiple plug term. 27 to air-flow sensor term. 27.
- From air-flow sensor term. 6 to multiple plug term. 6.

Temperature sensor II

- From multiple plug term. 13 to temperature sensor II term. 13.
- From temperature sensor II term. 49 to central ground (lead 49).

Test all contacts in plug connections.

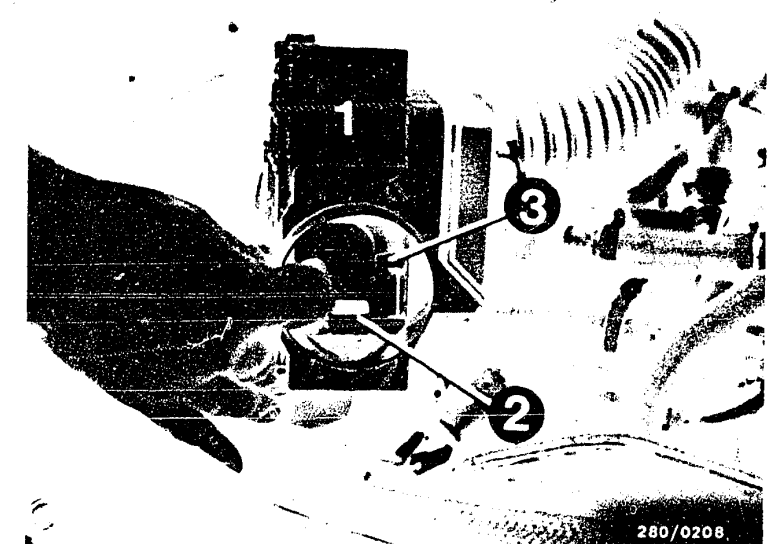
yes

Continued on F5/F6



- 1 = Temperature sensor II (white plug)
2 = Thermo-time switch (brown plug)
3 = Auxiliary-air device

- 1 = Temperature sensor I in air-flow sensor (intake passage)
2 = Stopper
3 = Temperature sensor II



F3

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



F4

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



Engine starts but then dies (Continued)

Air-flow sensor O.K.?

No

The air-flow sensor is fastened to battery mounting with three screws.

Testing:

Unscrew pipe piece between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Deflect sensor flap.

Test specification: 200 ... 1000 Ω

Checking the pump contact:

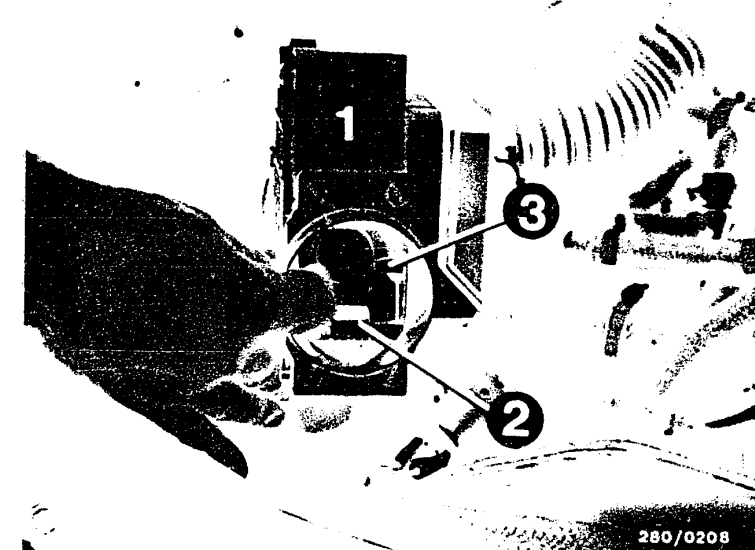
Remove plug from air-flow sensor. Measure resistance between term. 36 and term. 39 using ohmmeter. Deflect air-flow sensor flap. Set value approx. 0 Ω .

Caution:

After testing is completed, refit the pipe piece between air filter and air-flow sensor.

yes

Continued on F7/F8



1 = Air-flow sensor

F5

Engine starts but then dies
Lancia Bèta, Trevi, HPE, Coupé



F6

Engine starts but then dies
Lancia Bèta, Trevi, HPE, Coupé



Engine starts but then dies (continued)

Solenoid-operated air valve
O.K.?

no

Function:

a) Vehicles with automatic transmission:

After changing to a driving position, the solenoid-operated air valve opens: idle speed remains unchanged.

b) Vehicles with air conditioning

When air conditioning is switched on, solenoid-operated air valve opens, idle speed remains unchanged.

Test:

Prerequisite is that CO and idle speed are adjusted correctly. Ignition "ON", engine stationary, change to driving condition or switch on air conditioning and measure voltage at connection pins in solenoid-operated air valve.

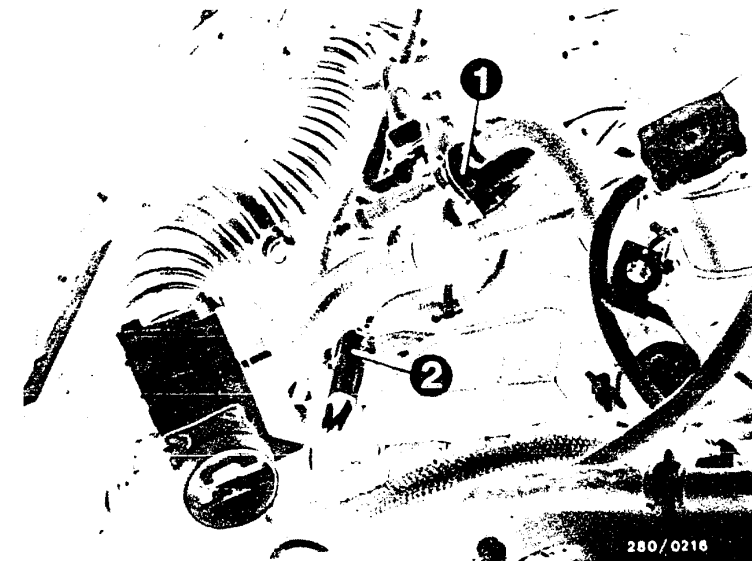
Set value 8 ... 15 V

Functional test: (engine running)

1. Solenoid-operated air valve voltage-free (disconnect plug). When defect is rectified, test leads and switches.
2. Squeeze off air hose to solenoid-operated air valve. When defect is rectified, replace faulty solenoid-operated air valve.

yes

Continued on F9/F10



2 = Solenoid-operated air valve

F7

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



F8

Engine starts but then dies
Lancia Beta, Trevi, HPE, Coupé



Engine starts but then dies (continued)

Are all hose lines and electric leads securely attached?
Visual examination. Is the air-intake system leak-tight?

no

Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose connection.

yes

Testing completed for customer complaint

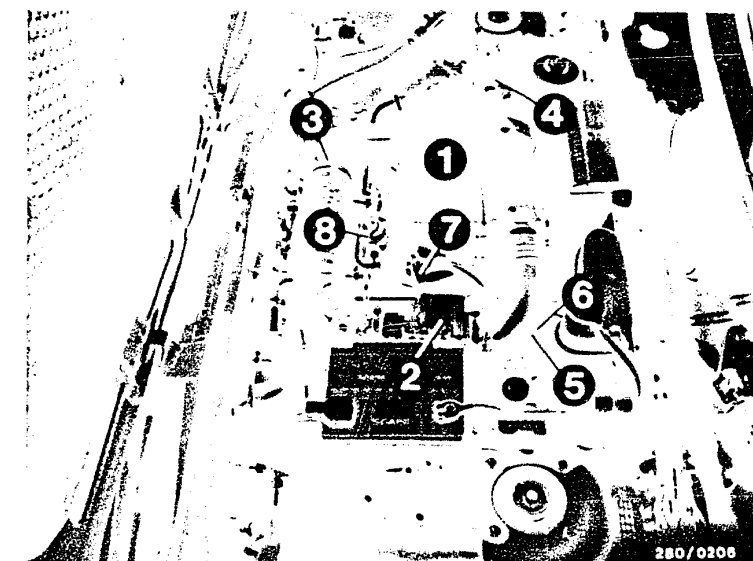
"Engine starts but then dies"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).



- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch.
- 4 = Relay set
- 5 = Thermo-time switch (brown plug)
- 6 = Temperature sensor II (engine) (white plug)
- 7 = Auxiliary-air device (black plug)
- 8 = Pressure regulator

F9

Engine starts but then dies

Lancia Beta, Trevi, HPE, Coupé



F10

Engine starts but then dies

Lancia Beta, Trevi, HPE, Coupé



UNEVEN ENGINE IDLE, ENGINE-SPEED ADJUSTMENT (IDLE) AND EXHAUST-GAS ADJUSTMENT

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

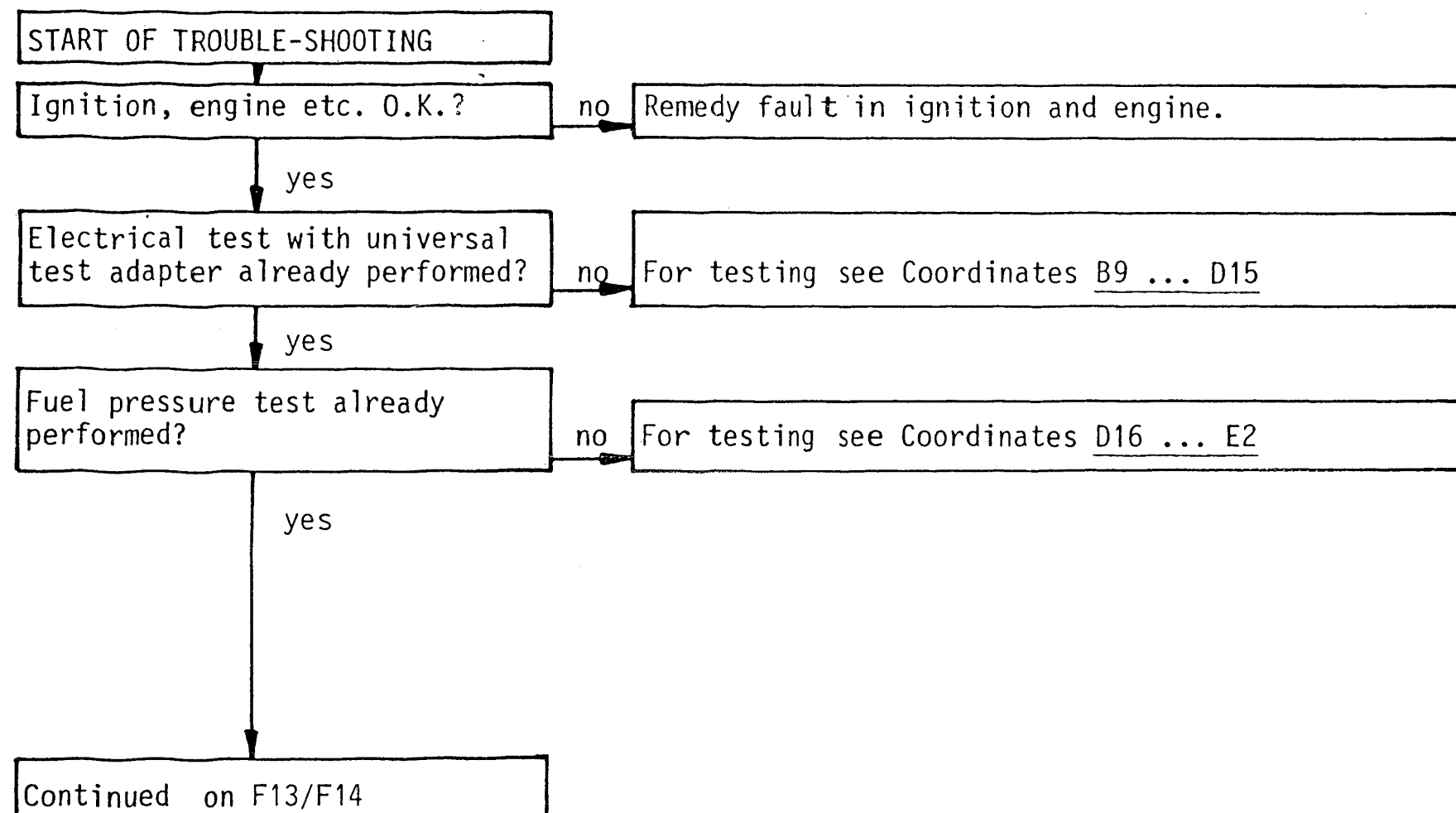
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



F11

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



F12

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

Throttle valve closed?

no

Testing:

Throttle valve closed?

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

Set the throttle valve to a hair's breadth gap.

Caution: throttle valve must not stick.

Throttle-valve switch 0 280 120 213 is not adjustable.

Adjustment of throttle-valve switch 0 280 120 300 (as from model 8.81):

Loosen fastening screws slightly. Connect ohmmeter from term. 2 and term. 18

Turn throttle-valve switch to the right until idle contact closes. (Indicator 0 Ω).

Adjustment test:

Pull on accelerator cable.

Idle contact must switch.

(Indicator $\infty \Omega$).

Trouble-shooting:

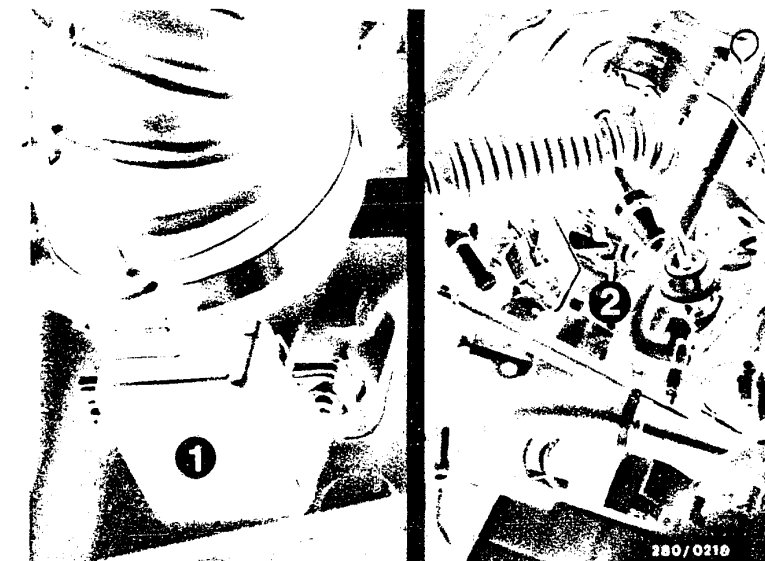
Test following leads with ohmmeter for continuity (set value approx. 0 Ω):

- From multiple plug term. 2 to throttle-valve switch term. 2.
- From throttle-valve switch term. 18 to multiple plug term. 18.

Eliminate contact resistance in plug connections.

yes

Continued on F15/F16



1 = Throttle-valve switch

2 = Throttle-valve stop screw

F13

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



F14

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

CO and idle speed correctly adjusted?

no

CO and idle adjustment: Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission, automatic transmission (selector lever in position N):

900 ... 1000 min⁻¹

CO setting:

2.0 ... 3.0 % vol. CO

Is CO concentration too high, adjust bypass screw (CO adjustment screw) in air-flow sensor one half turn anti-clockwise (from FD 248 with AF 5 hexagon screwdriver). Retest speed and CO concentration. Undertake corrections in various steps. Use new plugs after adjustment (1 280 508 012 red).

yes

Is idle speed not adjustable?

yes

Thermo-time switch O.K.?

no

Electrical test: Test thermo-time switch as follows: Remove plug and make direct resistance measurement at thermo-time switch using ohmmeter. Thermo-time switch 0 280 130 221 (15°/8sec):

1. Between term. "G" and ground at ambient temperature

(below +13°C):

50...70 Ω

Ambient temperature

(above +23°C):

50...70 Ω

2. Between term. "W" and ground at ambient temperature

(below +13°C):

0 Ω

Ambient temperature

(above +23°C):

∞ Ω

3. Between term. "G" and "W" at ambient temperature

(below +13°C):

50...70 Ω

Ambient temperature

(above +23°C):

∞ Ω

yes

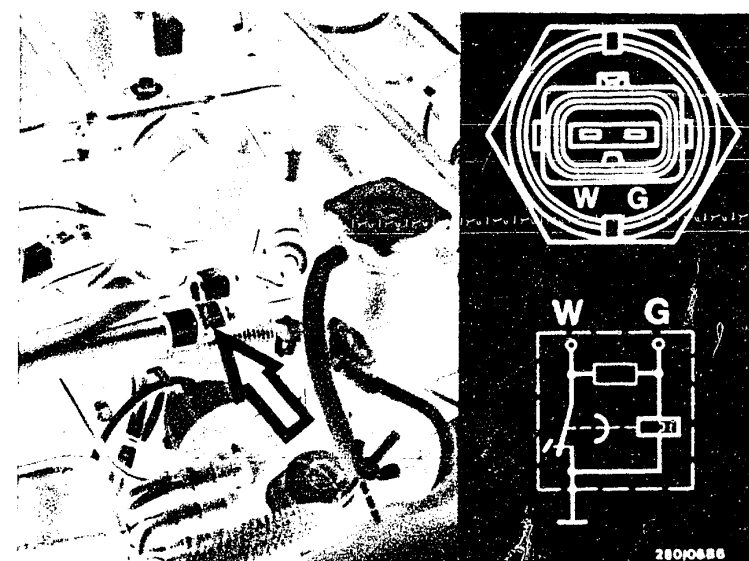
Continued on F17/F18



1 = CO adjusting screw

2 = Idle-speed adjusting screw

Arrow = Thermo-time switch



F15

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



F16

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

Thermo-time switch 0 280 130 214

(35° / 8 sec):

1. Between term. "G" and ground at ambient temperature

(below +30°C): 25...40 Ω

Engine at normal op. temp.

(above +40°C): 50...80 Ω

2. Between term. "W" and ground at ambient temperature

(below +30°C): 0 Ω

Engine at normal op. temp.

(above +40°C): 100...160 Ω

2. Between term. "G" and "W" at ambient temperature

(below +30°C): 25...40 Ω

Engine at normal op. temp.

(above +40°C): 50...80 Ω

yes

Start valve O.K.?

no

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

2. When removed:

Remove start valve (Caution: Fire hazard!). Fuel line and electric lead remain connected (place collector vessel under start valve). Build up fuel pressure (unscrew hose between air filter and air-flow sensor. Ignition "on" and deflect air-flow sensor flap).

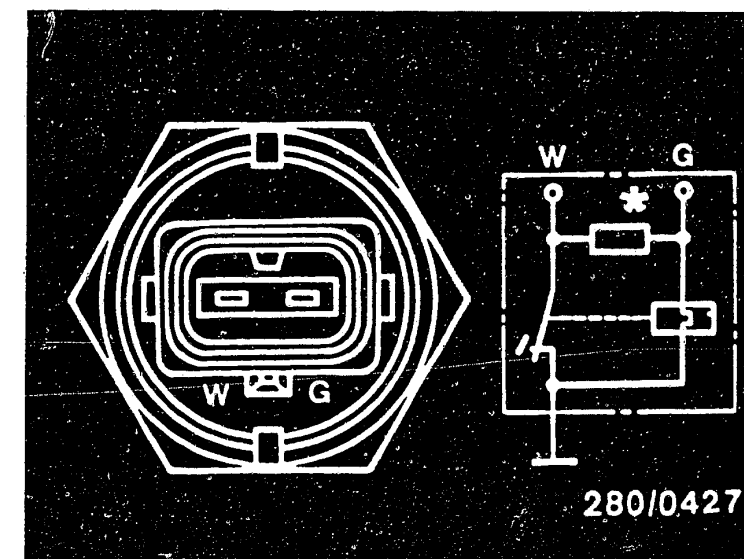
Test specification: Within 1 minute max.

1 drop may form at the mouth of the valve.

Caution! After testing is completed, refit hose between air filter and air-flow sensor. Make sure there are no leaks.

yes

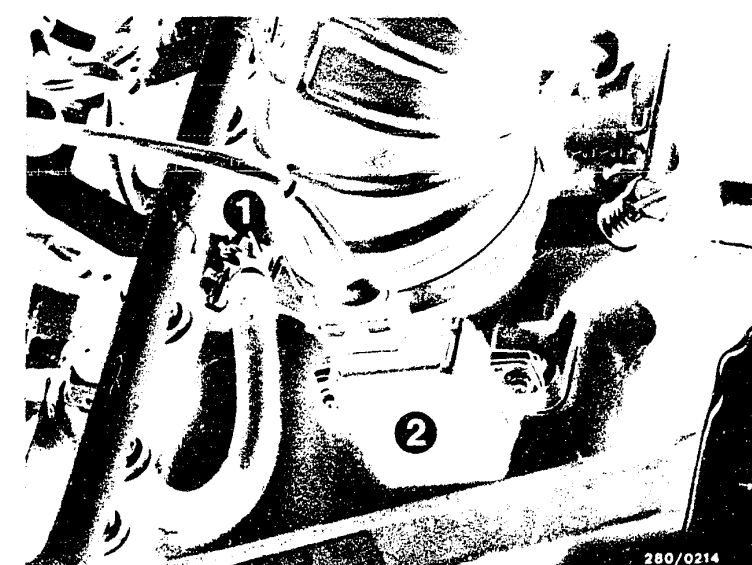
Continued on F19/F20



Thermo-time switch

* Resistor not applicable for 0 280 130 221

1 = Start valve
2 = Throttle-valve switch



F17

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



F18

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

Auxiliary-air device tested
(mechanically O.K.?)

no

Testing:

1. Visual examination of auxiliary-air device.
When cold, the device must be opened; when the engine is warm, it must be closed. If not, replace auxiliary-air device. (Remove hoses and look down, possibly using a small mirror).
2. Functional test of auxiliary-air device:
With the engine cold, pinch off hose to auxiliary-air device. Engine speed must drop. With the engine warm, pinch off hose to auxiliary-air device. Engine speed must not drop. If incorrect, replace auxiliary-air device (pay attention to direction of flow).

yes

Continued on F21/F22

F19

Uneven engine idle

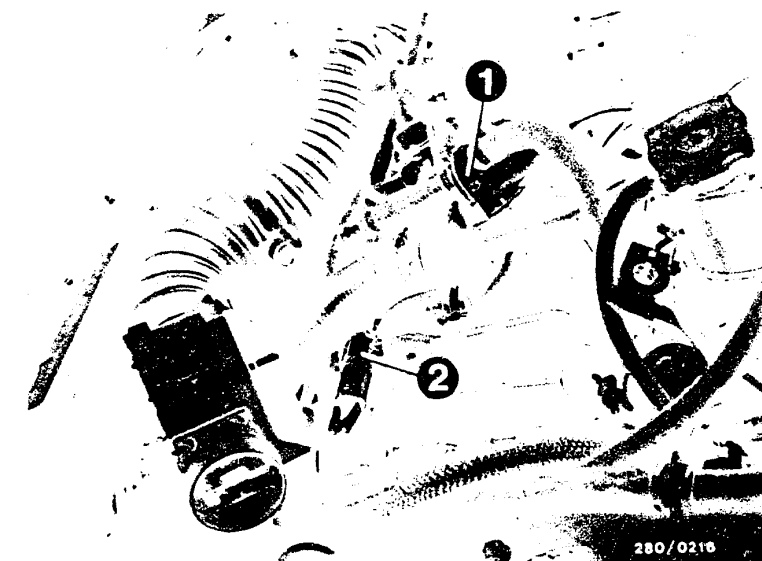
Lancia Beta, Trevi, HPE, Coupé



F20

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



1 = Thermo-time switch

2 = Solenoid-operated air valve

Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(continued)

Solenoid-operated injection
valve O.K.?

no

1. Mechanical test

Remove and replace injection valve plugs individually in succession from injection valves with engine running. Engine speed must fall with good injection valves. Test connection leads of relay set term. 88b, term. 88e for continuity via solenoid-operated injection valves to control unit term. 14, 15, 32 and 33. Replace leads or solenoid-operated injection valves if necessary.

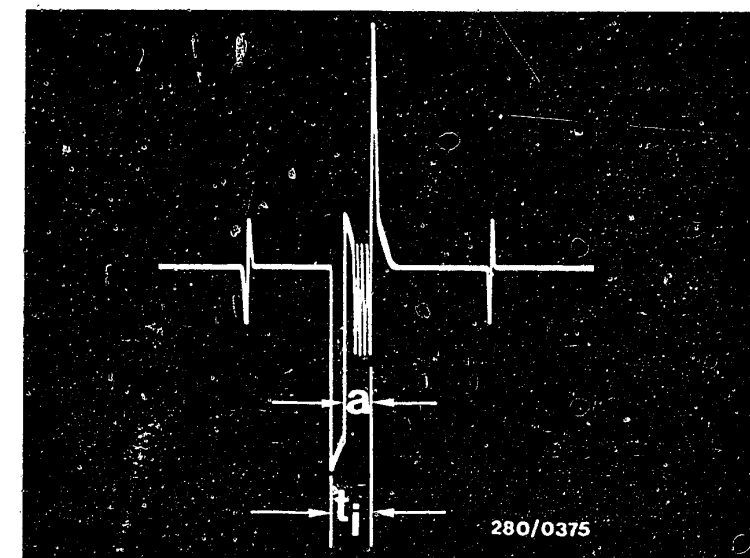
2. Functional test

Connect test lead as follows: The two-pole plug connections for test lead are switched between one solenoid-operated injection valve and its connection lead. Only one connection terminal of the remaining two connection terminals of the test lead must be connected to the special input of the motortester. Insulate free connection terminal (danger of short-circuit!). The picture adjacent is visible on oscilloscope when connection is correct. With the aid of test lead, the injection pulses in the solenoid-operated injection valves can be tested with engine running with an ignition oscilloscope. If the adjacent picture is not achieved, or deviations (interference, misfiring etc.) are visible, the other solenoid-operated injection valves should also be examined. With interference → test wiring. With misfires → correct loose contacts in leads or in plug connections.

Yes

Continued on G3/G4

Continued on F23/F24



Injection pulse for a currentless regulated output stage (measured at solenoid-operated injection valve).

a = Pulse length
(dependent on engine load)

t_i = Injection pulse

At idle without engine load, current regulation "a" is not yet visible on oscilloscope.

F21

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



F22

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé

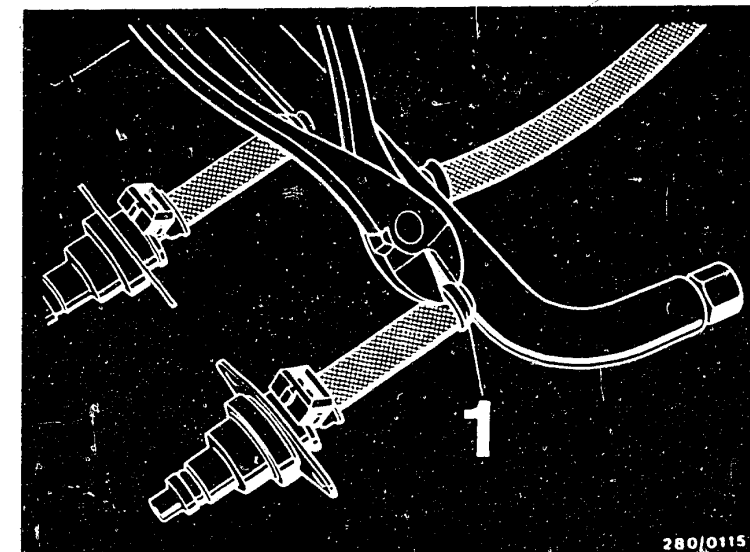


Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(continued)

3. Replace solenoid-operated injection valves

Pinch open hose termination sleeves (1) for solenoid-operated injection valves.

Cut open fuel hose with soldering iron or soldering pistol vertically and remove (arrow).



1 = Hose termination sleeve

yes

Continued on G3/G4

Continued on G1/G2

F23

Uneven engine idle

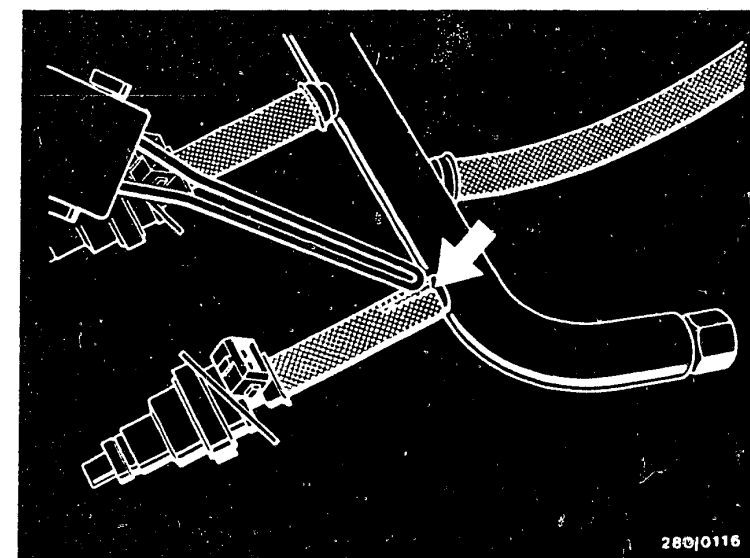
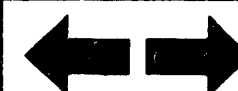
Lancia Beta, Trevi, HPE, Coupé



F24

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(continued)

yes

Mount new or repaired solenoid-operated injection valve with hose termination sleeve. Moisten interior of hose with fuel and slide onto tail-piece to stop.

Installation of solenoid-operated injection valves

Pay attention to perfect seat of rubber seal ring for each solenoid-operated injection valve. Replace faulty seal rings. Press all 4 solenoid-operated injection valves with fuel distributor pipe equally into seat.

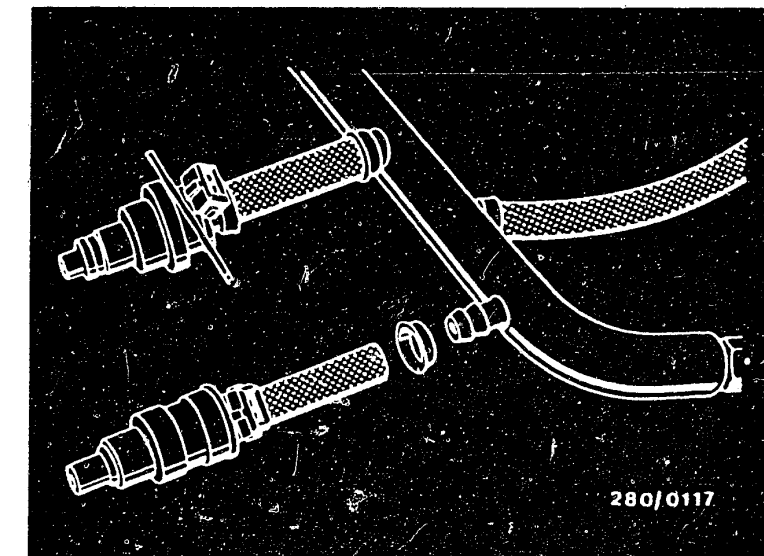
Important! All solenoid-operated injection valves must be installed tight.

Fasten fuel distribution pipe (screw solenoid-operated injection valves tight with fastening on intake manifold). Also screw central fastening and return fastening tight. Replace all air and vacuum hoses. Fastening cup seals to air-flow sensor and throttle-valve switch. Also tighten solenoid-operated air valve and crankcase bleeding on auxiliary-air device.

Retest all fuel and air connections for tight seat.

Start engine and test for false intake of air.

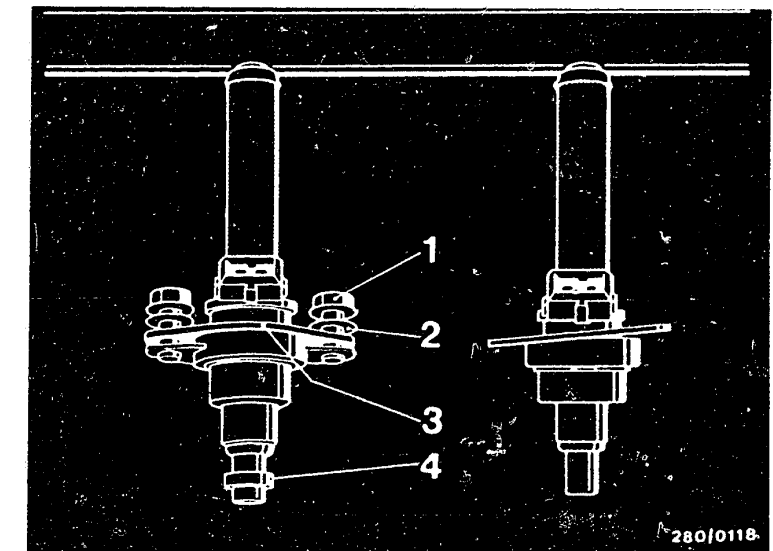
Continued on G3/G4



1 = Hose termination sleeve

(Similar construction for Lancia-Beta):

- 1 = Hexagon screw
- 2 = Washer
- 3 = Retainer
- 4 = Rubber ring



G1

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



G2

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment
(continued)

Air-flow sensor O.K.?

no

The air-flow sensor is fastened to battery mounting with three screws.

Testing

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

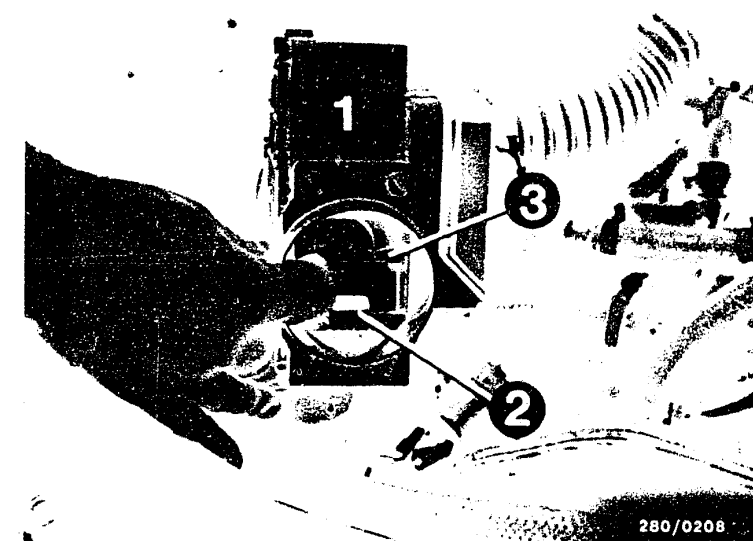
Test specification: 200 ... 1000 Ω

Caution!

After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on G5/G6



1 = Air-flow sensor

G3

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



G4

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

Solenoid-operated air valve
O.K.?

no

Function:

a) Vehicles with automatic transmission:

After changing to a driving position, the solenoid-operated air valve opens: idle speed remains unchanged.

b) Vehicles with air conditioning

When air conditioning is switched on, solenoid-operated air valve opens, idle speed remains unchanged.

Test:

Prerequisite is that CO and idle speed are adjusted correctly. Ignition "ON", engine stationary, change to driving condition or switch on air conditioning and measure voltage at connection pins in solenoid-operated air valve.

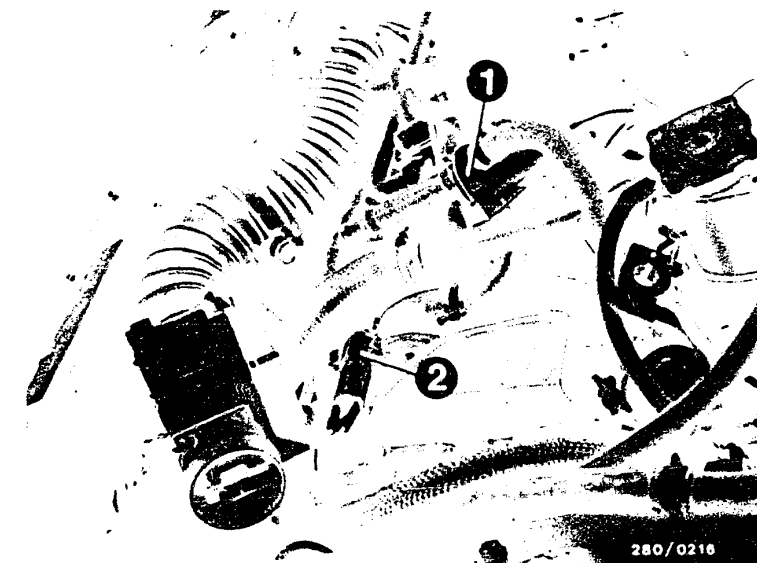
Set value 8 ... 15 V

Functional test: (engine running)

1. Solenoid-operated air valve voltage-free (disconnect plug). When defect is rectified, test leads and switches.
2. Squeeze off air hose to solenoid-operated air valve. When defect is rectified, replace faulty solenoid-operated air valve.

yes

Continued on G7/G8



2 = Solenoid-operated air valve

G5

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



G6

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (continued)

Are all hose lines and electric leads securely attached? Visual examination. Is the air-intake system leak-tight?

no

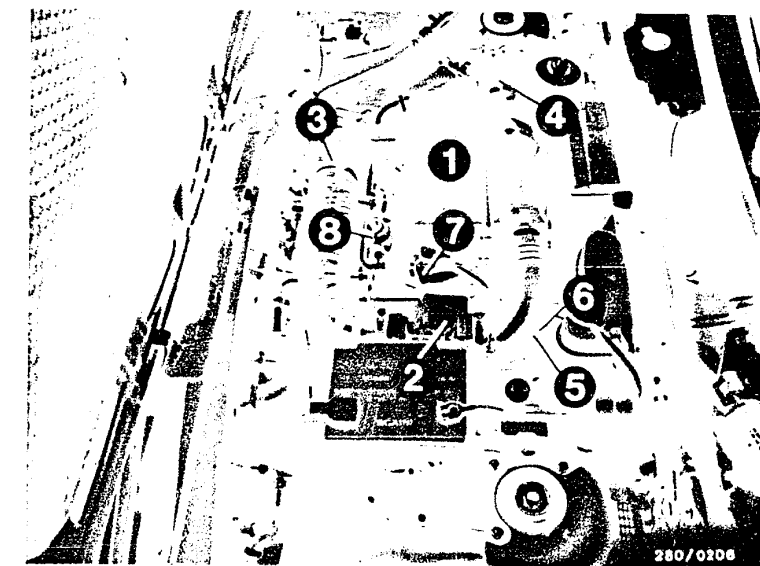
Check whether hoses of air-intake system and of fuel line system are securely attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks with new seals or by re-tightening the connecting screws.

Checking for leaks:

Seal off exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0,3 bar) into the intake manifold with a compressed-air gun. Seal off connection port on auxiliary-air device. Open throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak. Check electric contacts for loose connection.

yes

Continued on G9/G10



- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Relay set
- 5 = Thermo-time switch (brown plug)
- 6 = Temperature sensor II (engine) (white plug)
- 7 = Auxiliary-air device (black plug)
- 8 = Pressure regulator

G7

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



G8

Uneven engine idle
Lancia Beta, Trevi, HPE, Coupé



Uneven engine idle, speed adjustment (idle) and exhaust-gas adjustment (Continued)

CO and engine speed correctly adjusted?

no

CO idle adjustment

Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed:

Manually-shifted transmission, automatic transmission (selector lever in position N):

900 ... 1000 min⁻¹

CO adjustment:

2.0 ... 3.0% by vol.CO

Is CO concentration too high, adjust bypass screw (CO adjustment screw) in air-flow sensor one half turn anti-clockwise. Retest speed and CO concentration. Undertake corrections in various steps. Use new plugs after adjustment (colour red 1 280 508 012).

yes

Is idle speed not adjustable?

yes

Testing completed for customer complaint

"Uneven engine idle, engine-speed adjustment (idle) and exhaust-gas adjustment".

Customer complaint remedied?

no

Further possibilities:

Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "Direct trouble-shooting", see "Detailed trouble-shooting" (Coordinates B3/B4).

Engine not mechanically O.K. (Compression, valve setting, valve timing, worn camshaft).



1 = CO adjusting screw

2 = Idle-speed adjusting screw

G9

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



G10

Uneven engine idle

Lancia Beta, Trevi, HPE, Coupé



POOR THROTTLE TAKE-UP

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

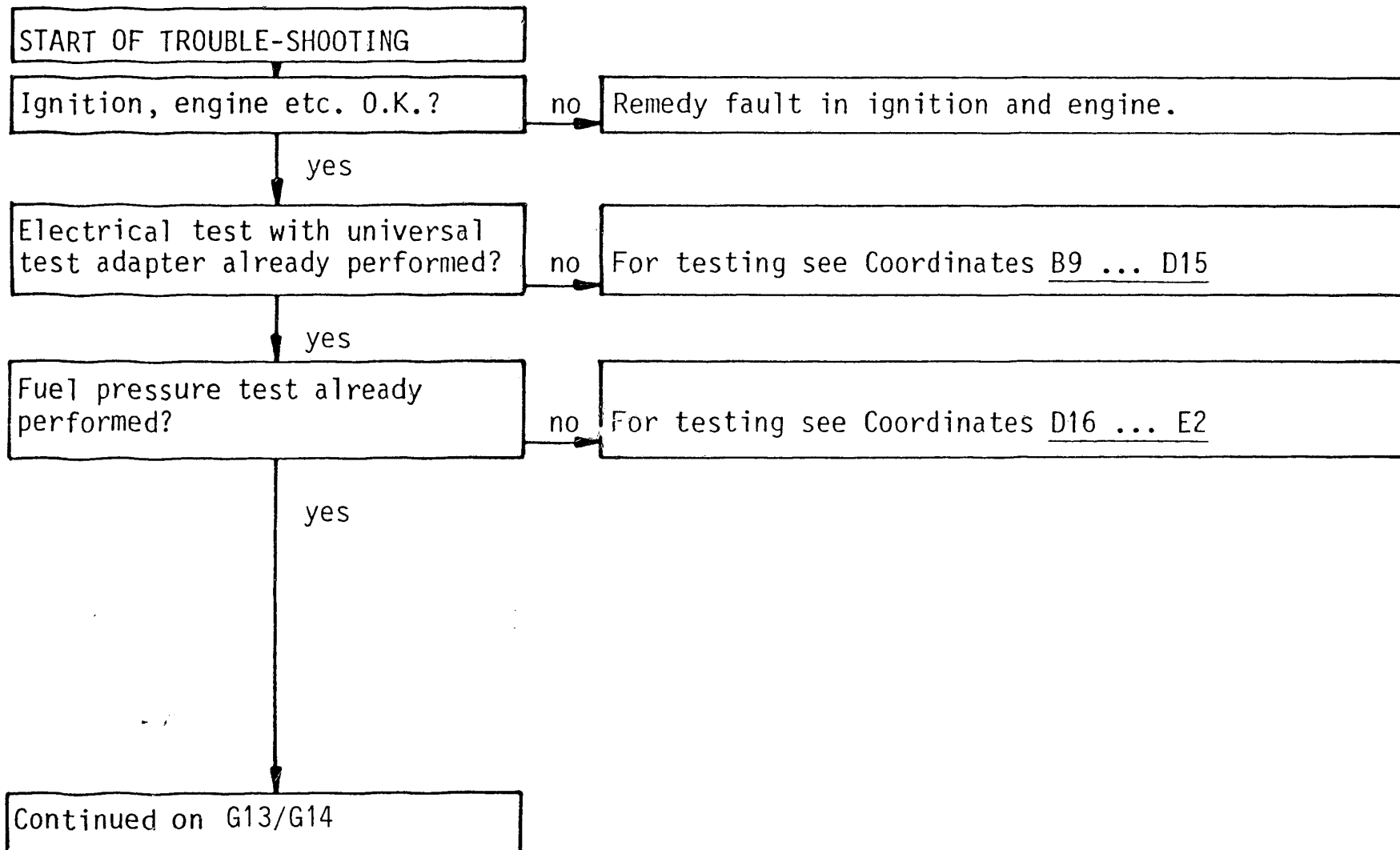
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



G11

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



G12

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



Poor throttle take-up (continued)

Throttle valve closed?

no

Testing:

Throttle valve closed?

Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.

Set the throttle valve to a hair's breadth gap.

Caution: throttle valve must not stick.

Throttle-valve switch 0 280 120 213 is not adjustable.

Adjustment of throttle-valve switch 0 280 120 300 (as from model 8.79):

Loosen fastening screws slightly. Connect ohmmeter from term. 2 and term. 18

Turn throttle-valve switch to the right until idle contact closes. (Indicator 0Ω).

Adjustment test:

Pull on accelerator cable.

Idle contact must switch.

(Indicator $\infty \Omega$).

Trouble-shooting:

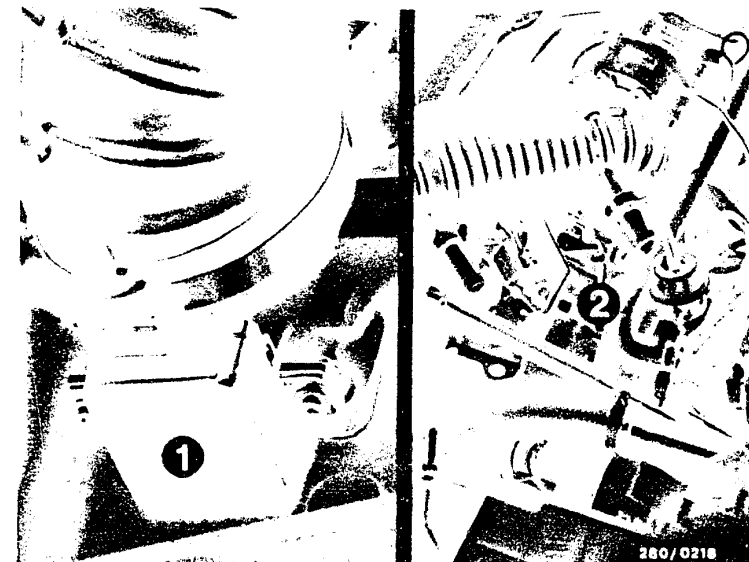
Test following leads with ohmmeter for continuity (set value approx. 0Ω):

- From multiple plug term. 2 to throttle-valve switch term. 2.
- From throttle-valve switch term. 18 to multiple plug term. 18.

Eliminate contact resistance in plug connections.

yes

Continued on G15/G16



1 = Throttle-valve switch

2 = Throttle-valve stop screw

G 13

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé

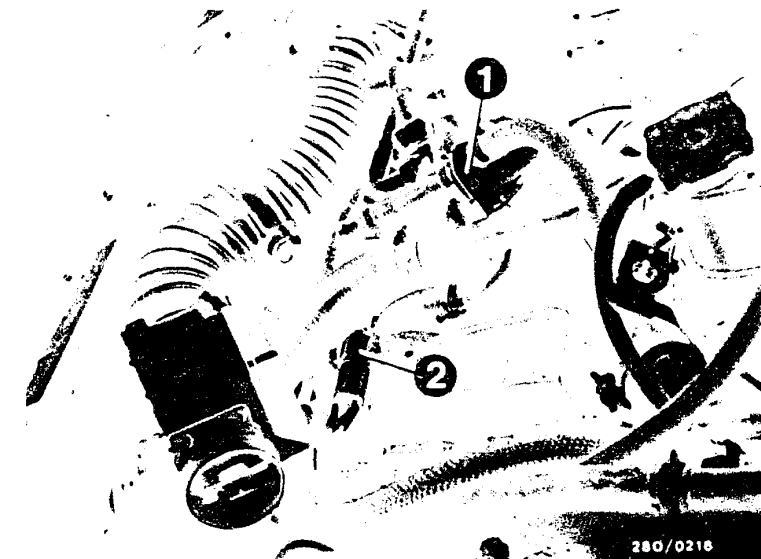
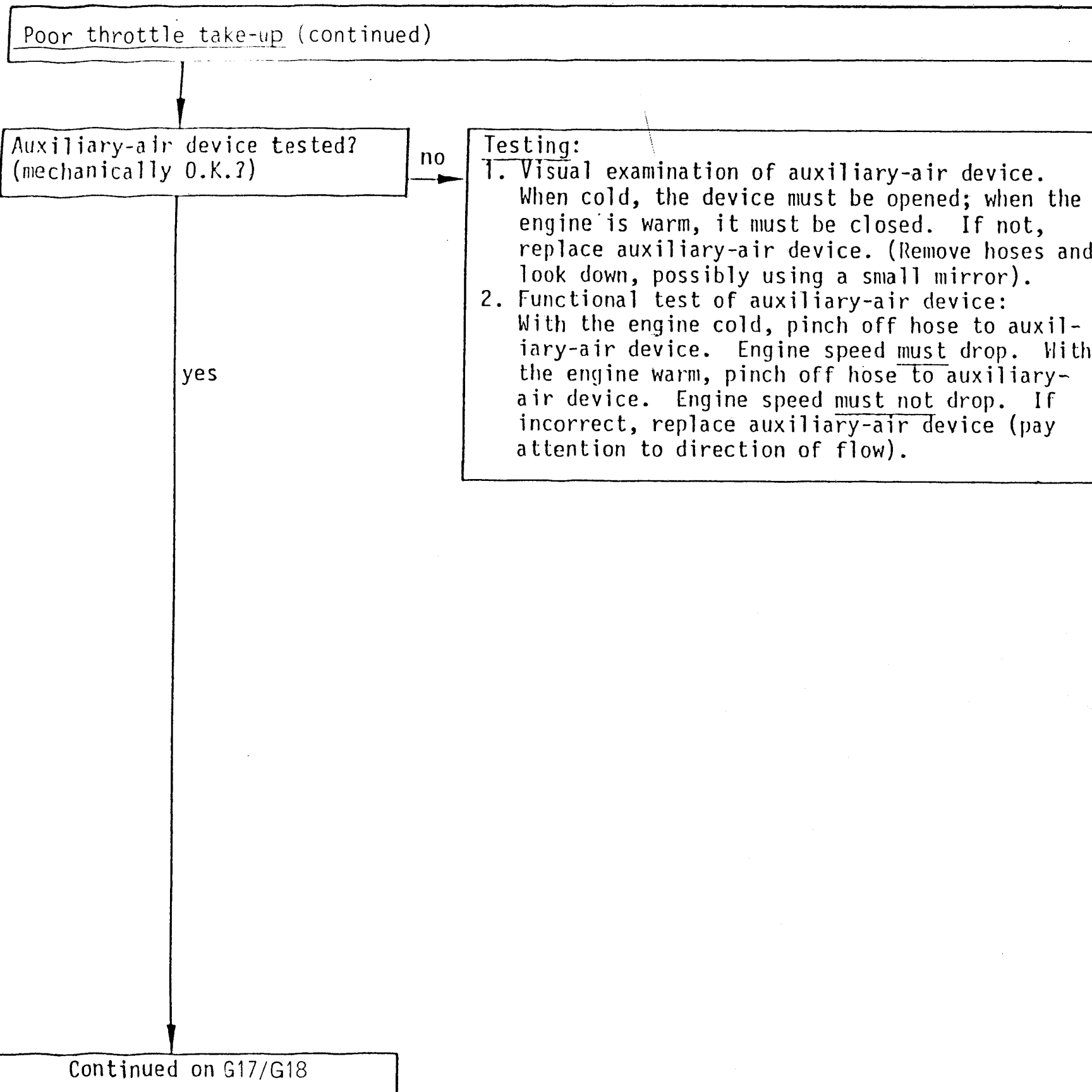


G 14

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé





1 = Auxiliary-air device
2 = Solenoid-operated air valve

G 15

Poor throttle take-up
Lancia Beta, Trevi, HPE, Coupé



G 16

Poor throttle take-up
Lancia Beta, Trevi, HPE, Coupé



Poor throttle take-up (continued)

Air-flow sensor O.K.?

no

Testing

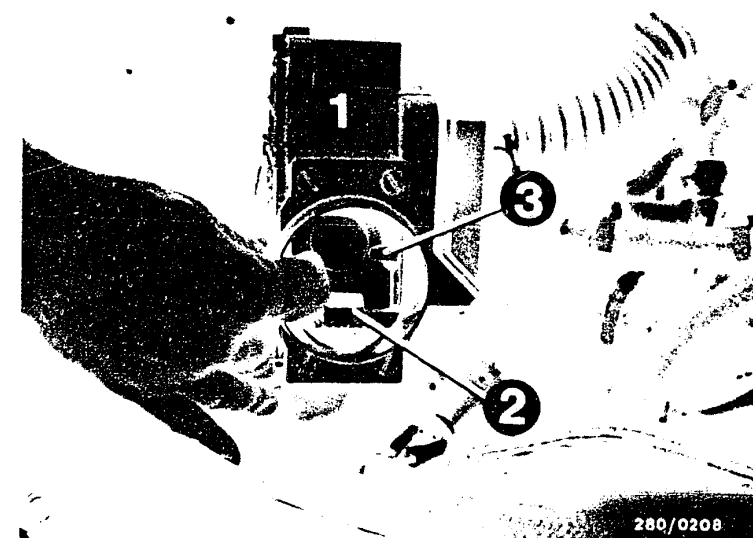
The air-flow sensor is fastened to battery mounting with three screws.

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

Test specification: 200 ... 1000 Ω

yes

Continued on G19/G20



- 1 = Air-flow sensor
- 2 = Stopper
- 3 = Temperature sensor I

G17

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



G18

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



Poor throttle take-up (continued)

yes

Potentiometer test (noise test):

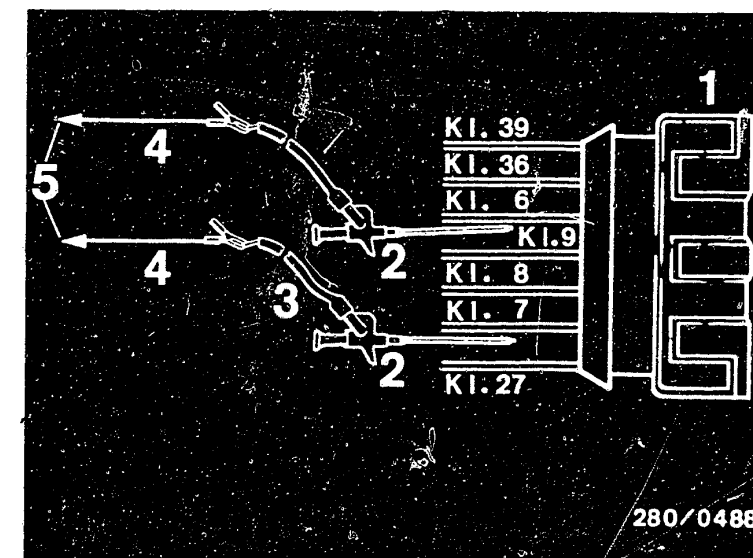
Dismount air-flow sensor. (Loosen hose clamps on both sides of air-flow sensor, and fastening screws for air-flow sensor on battery mounting. Leave connection plug connected.) Place motor-tester on special input and connect with special cable to air-flow sensor term. 7 (red clip) and term. 6 (black clip).

Manufacture adapter lead:

User fabrication: Two leads of approx. 1 m in length and approx. 1.5 mm² diameter. 2 test prods are fastened to one end. Insulate approx. 2 cm at other end and connect terminal for special input connection lead.

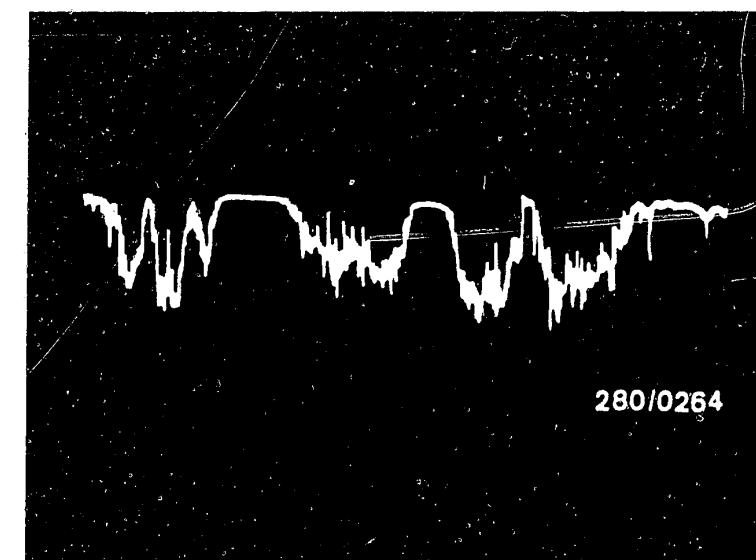
Caution!

Insulate bare connections on adapter lead. (Danger of short-circuit!) Measure carefully into connection plug of air-flow sensor. Do not bend plug springs. Adjust control lever for framing on motortester to left stop (calibrated position). Ignition "ON". Deflect flap on air-flow sensor several times by pushing. In good air-flow sensor a stroke signal must be visible without alarm on the oscilloscope. In defect air-flow sensor, a noise signal similar to adjacent picture is visible. Replace air-flow sensor. Disconnect adapter lead after test and replace rubber grommet correctly. Mount air-flow sensor. Replace all hoses and tighten (leakage).



- 1 = Air-flow sensor connection plug
- 2 = Terminal test prod
- 3 = Adapter lead
(user fabrication)
- 4 = Special input connection
- 5 = Motortester special input

Noise signal in faulty air-flow sensor



Continued on G21/G22

G 19

Poor throttle take-up

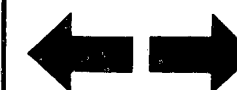
Lancia Beta, Trevi, HPE, Coupé



G 20

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



Poor throttle take-up (continued)

Are all hose lines and electric leads securely connected? Visual examination.
Is the air-intake system leak-tight?

no

Check whether hoses of air-intake system and of fuel line system are correctly attached, not kinked or damaged. If necessary, replace hoses. Eliminate leaks by using new seals or by re-tightening the connecting screws.

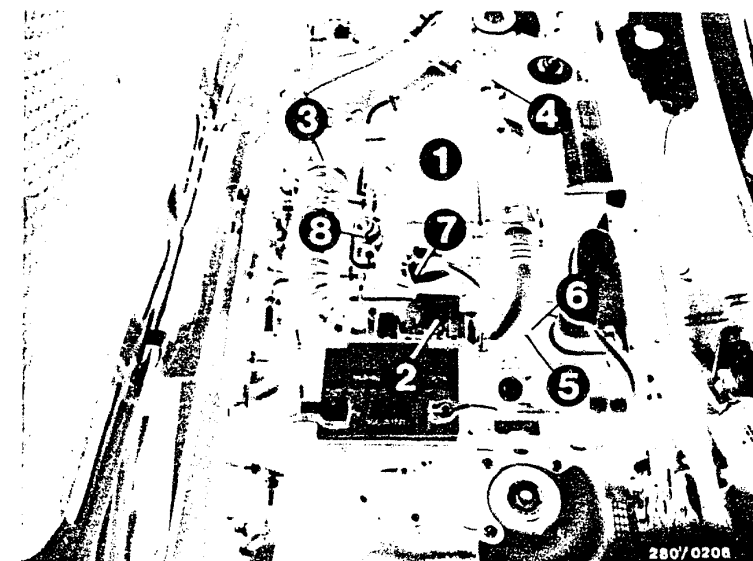
Leak test:

Seal off the exhaust tail pipe. Screw off hose from air filter to air-flow sensor on air-flow sensor and seal off air-flow sensor duct. Pull off hose after auxiliary-air device and blow air (0.3 bar) into the intake manifold with a compressed-air gun. Seal off the connection port on the auxiliary-air device. Open the throttle valve fully while doing this. Brush or spray all joints with soapy water. Bubbling or foaming indicates a leak.

Check electric contacts for loose contacts.

yes

Continued on G23/G24



- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Relay set
- 5 = Thermo-time switch (brown plug)
- 6 = Temperature sensor II (engine) (white plug)
- 7 = Auxiliary-air device (black plug)
- 8 = Pressure regulator

G21

Poor throttle take-up
Lancia Beta, Trevi, HPE, Coupé



G22

Poor throttle take-up
Lancia Beta, Trevi, HPE, Coupé



Poor throttle take-up (continued)

CO and idle speed correctly adjusted?

no

CO and idle adjustment: Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission, automatic transmission (selector lever in position N):

900 ... 1000 min⁻¹

CO setting:

2.0 ... 3.0 % vol. CO

Is CO concentration too high, adjust bypass screw (CO adjustment screw) in air-flow sensor one half turn anti-clockwise (from FD 248 with AF 5 hexagon screwdriver). Retest speed and CO concentration. Undertake corrections in various steps. Use new plugs after adjustment (1 280 508 012 red).

yes

Can engine speed not be adjusted?

yes

Testing completed for customer complaint

"Poor throttle take-up"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).



1 = CO adjusting screw

2 = Idle-speed adjusting screw

G23

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



G24

Poor throttle take-up

Lancia Beta, Trevi, HPE, Coupé



ENGINE MISSING UNDER ALL OPERATING CONDITIONS

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.

START OF TROUBLE-SHOOTING

Ignition, engine etc. O.K.?

no

Remedy fault in ignition and engine.

yes

Electrical test with universal
test adapter already performed?

no

For testing see Coordinates B9 ... D15

yes

Fuel pressure test already
performed?

no

For testing see Coordinates D16 ... E2

yes

Continued on H3/H4

H1

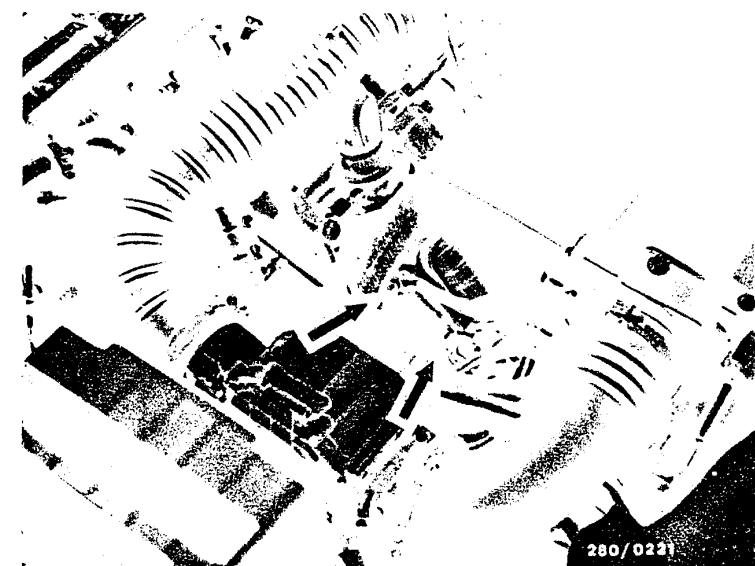
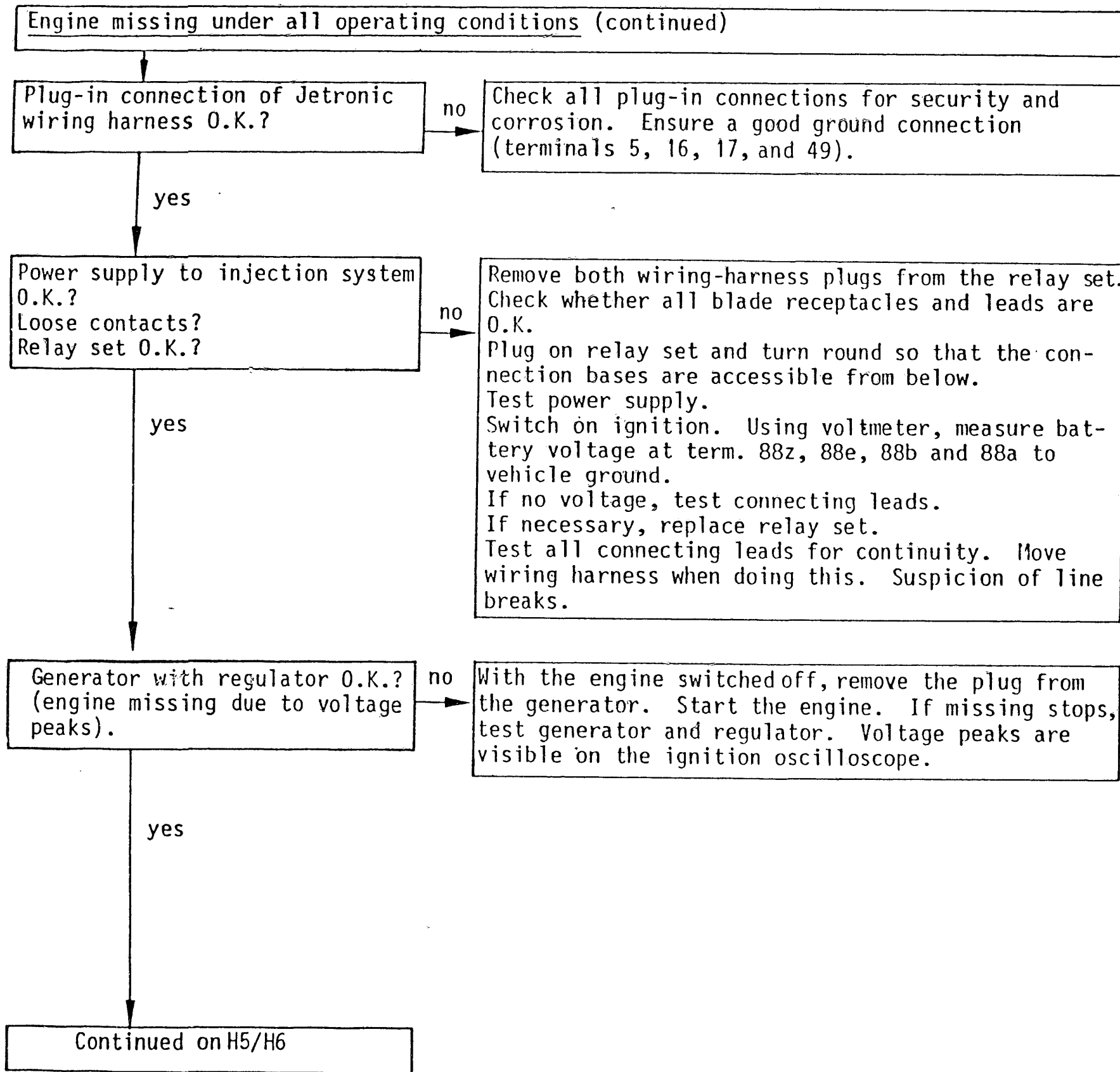
Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H2

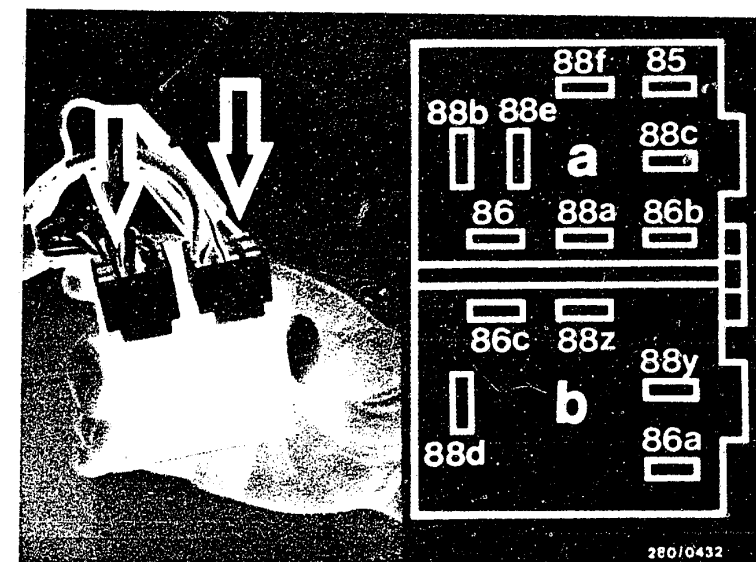
Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé





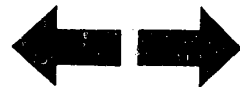
Arrow = Central ground

Measure voltage on back of plug.
a = Jetronic wiring harness
b = Vehicle wiring harness



H3

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H4

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Air-flow sensor O.K.?

yes

Continued on H9/H10

no

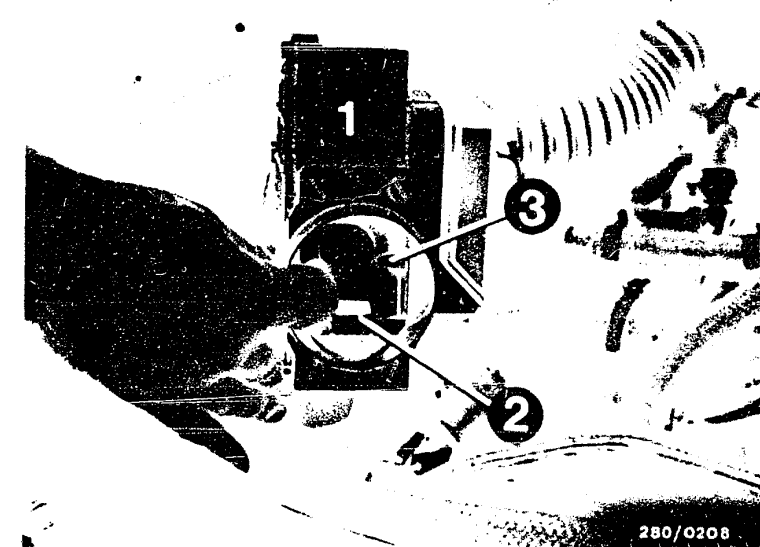
The air-flow sensor is fastened to battery mounting with three screws.

Testing

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

Test specification: 200 ... 1000 Ω

Continued on H7/H8



1 = Air-flow sensor

H5

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H6

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

yes

Potentiometer test (noise test):

Dismount air-flow sensor. (Loosen hose clamps on both sides of air-flow sensor, and fastening screws for air-flow sensor on battery mounting. Leave connection plug connected.) Place motor-tester on special input and connect with special cable to air-flow sensor term. 7 (red clip) and term. 6 (black clip).

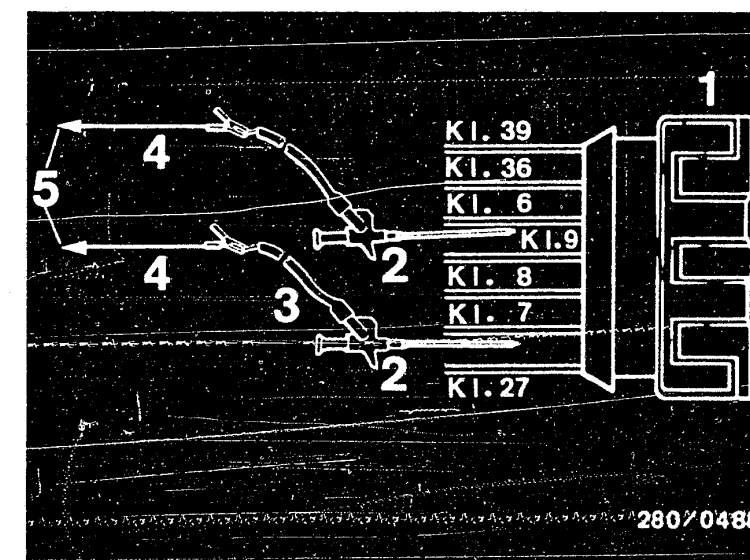
Manufacture adapter lead:

User fabrication: Two leads of approx. 1 m in length and approx. 1.5 mm² diameter. 2 test prods are fastened to one end. Insulate approx. 2 cm at other end and connect terminal for special input connection lead.

Caution!

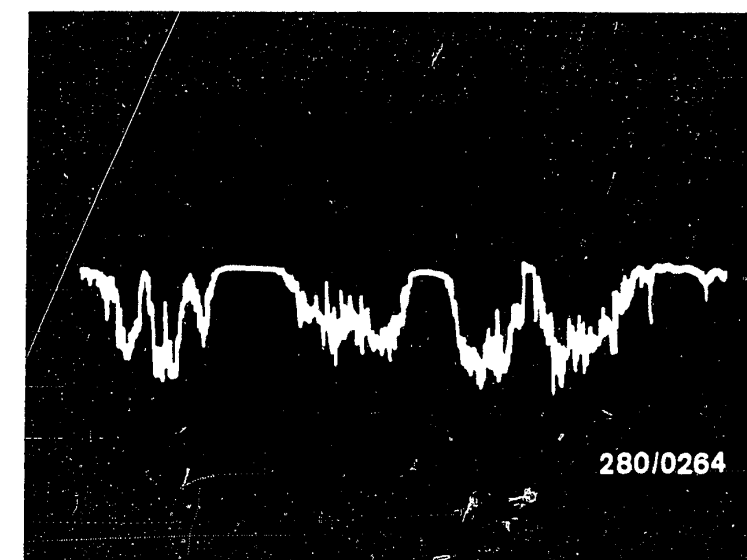
Insulate bare connections on adapter lead. (Danger of short-circuit!) Measure carefully into connection plug of air-flow sensor. Do not bend plug springs. Adjust control lever for framing on motortester to left stop (calibrated position). Ignition "ON". Deflect flap on air-flow sensor several times by pushing. In good air-flow sensor a stroke signal must be visible without alarm on the oscilloscope. In defect air-flow sensor, a noise signal similar to adjacent picture is visible. Replace air-flow sensor. Disconnect adapter lead after test and replace rubber grommet correctly. Mount air-flow sensor. Replace all hoses and tighten (leakage).

Continued on H9/H10



- 1 = Air-flow sensor connection plug
- 2 = Terminal test prod
- 3 = Adapter lead (user fabrication)
- 4 = Special input connection
- 5 = Motortester special input

Noise signal in faulty air-flow sensor



H7

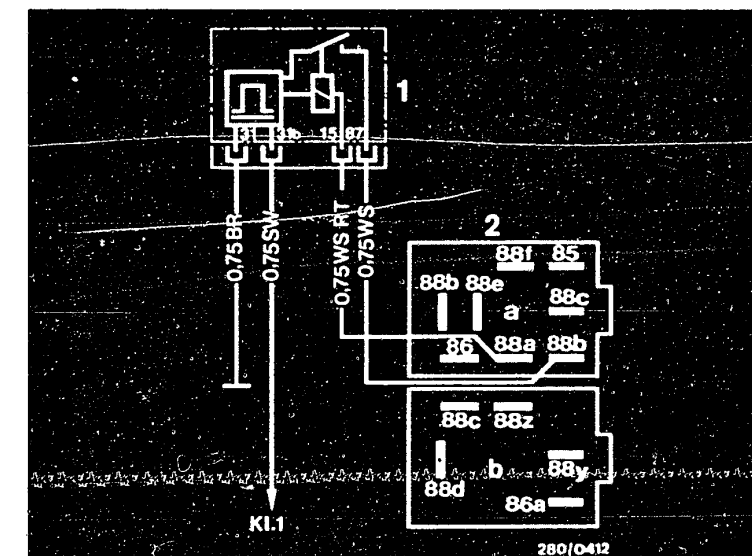
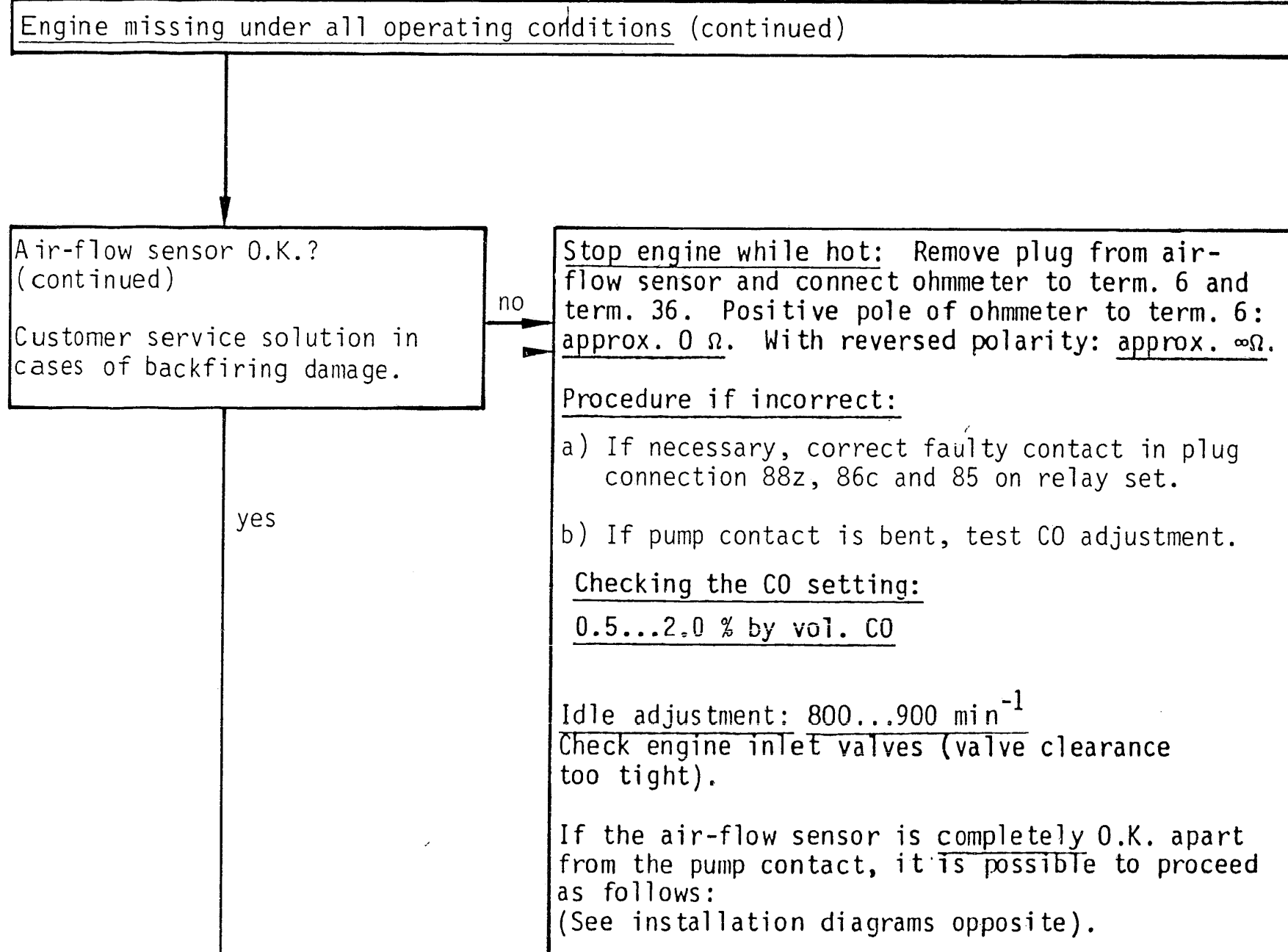
Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H8

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé





1=Fuel pump relay
 Striebel CO
 (Part No. 89 64 60)

2=Relay set
 Connection base viewed from below
 a=Jetronic wiring harness
 b=Vehicle wiring harness
 Wiring harness for user-fabrication

H9

Engine missing under all op. conditions
 Lancia Beta, Trevi, HPE, Coupé



H10

Engine missing under all op. conditions
 Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Installation instructions:

Fasten relay base for fuel pump relay to suitable position, connect brown lead from constructed wiring harness to a ground point.

Remove relay set.

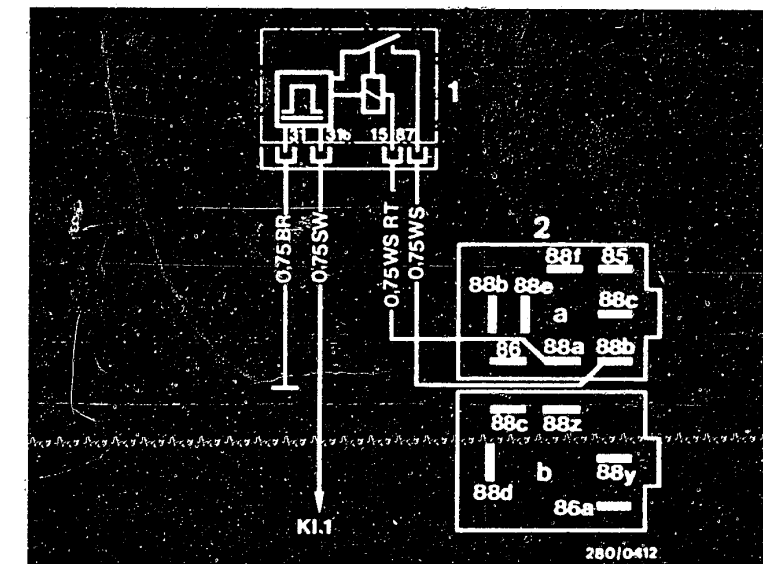
Lay white and red/white lead from constructed wiring harness along Jetronic wiring harness to relay set and connect to relay set according to wiring diagram. Lay black lead from produced wiring harness to ignition coil. Connect lead to ignition coil term. 1.

Caution:

After testing is completed, refit pipe piece between air filter and air-flow sensor.

yes

Continued on H13/H14



1=Fuel pump relay

Striebel C0

(Part No. 89 64 60)

2=Relay set

Connection base viewed from below

a=Jetronic wiring harness

b=Vehicle wiring harness

Wiring harness for user-fabrication

H11

Engine missing under all op. conditions

Lancia Beta, Trevi, HPE, Coupé



H12

Engine missing under all op. conditions

Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Solenoid-operated injection valve tested for function?

no

Connect test lead as follows:
The two-pole plug connections for test lead are switched between one solenoid-operated injection valve and its connection lead.

Only one connection terminal of the two remaining connection terminals on the test lead must be connected with the special input of the motor-tester.

Caution:

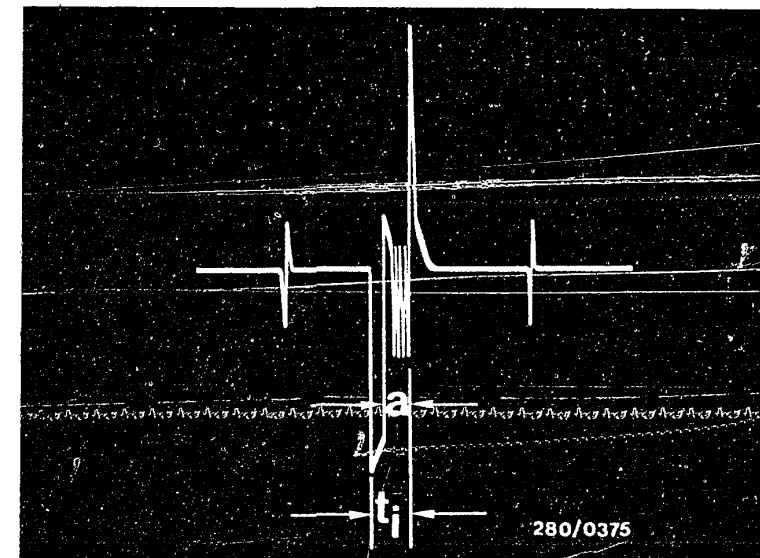
The other connection terminal must not come into contact with the vehicle ground!

The adjacent picture is visible on the oscilloscope when connection is correct. With the aid of the test lead, the injection pulses can be tested in the solenoid-operated injection valves with running engine with an ignition oscilloscope.

If the adjacent picture is not achieved, or deviations (interference, misfires, etc.) are visible, the other solenoid-operated injection valves must also be examined. In case of interference, test lead wiring.
In case of misfire, correct loose contacts in leads or in plug connections.

yes

Continued on H15/H16



Injection pulse for a current regulated terminal (measured on solenoid-operated injection valve)

a = Pulse length (dependent on engine load)

t_i = Injection pulse

At idle without engine load, "a" is not yet visible on oscilloscope

H 13

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H 14

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Solenoid-operated injection valve O.K.?

no

Replacing solenoid-operated injection valve

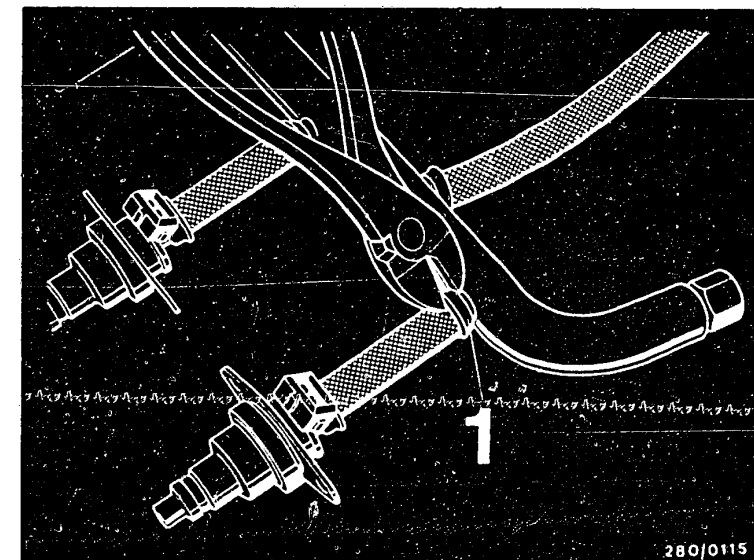
Pinch open hose termination sleeves (1) on solenoid-operated injection valves.

Cut open fuel hose with soldering iron or soldering pistol vertically and pull off (arrow).

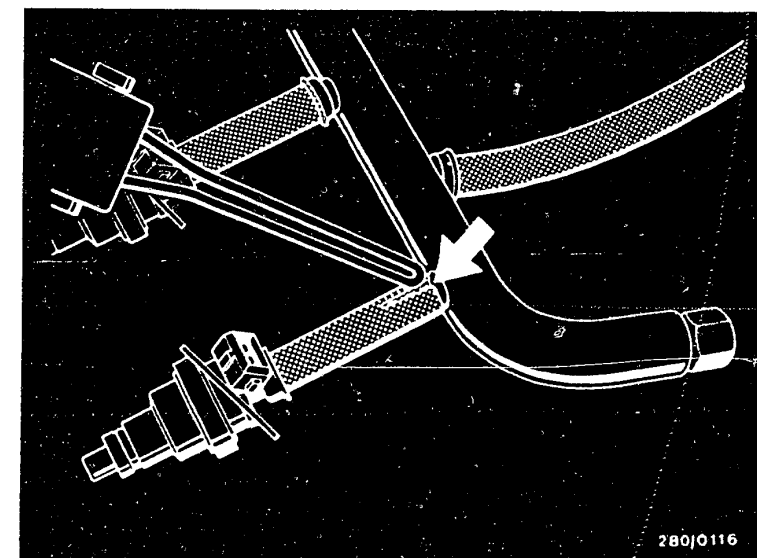
yes

Continued on H19/H20

Continued on H17/H18



1 = Hose termination sleeve



H15

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H16

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Mount new or repaired solenoid-operated injection valves with hose termination sleeve.
Moisten interior of hose with fuel and slide onto tailpiece to stop.

Installation of solenoid-operated injection valves

Pay attention to perfect seat of rubber seal ring for each solenoid-operated injection valve.
Replace faulty seal rings. Press all 4 solenoid-operated injection valves with fuel distributor pipe equally into seat.

Important!

All solenoid-operated injection valves must be installed tight.

Fasten fuel distribution pipe (screw solenoid-operated injection valves tight with fastening on intake manifold). Also screw central fastening and return fastening tight.

Replace all air and vacuum hoses.

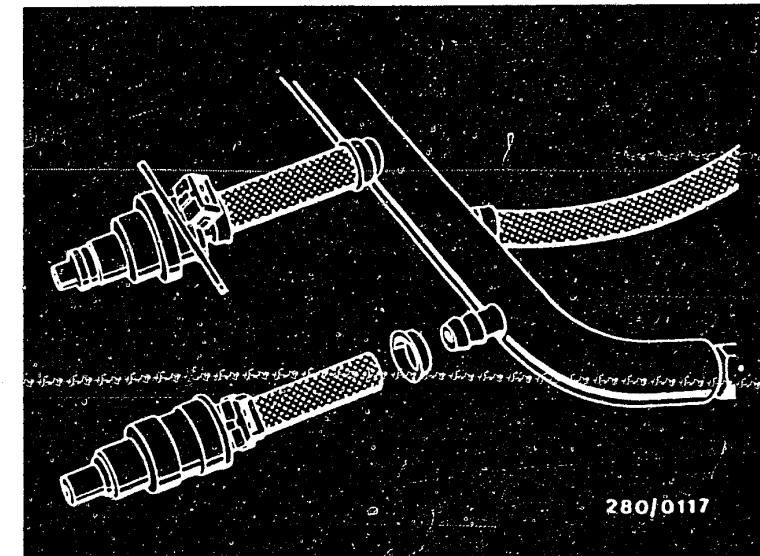
Fastening cup seals to air-flow sensor and throttle-valve switch. Also tighten solenoid-operated air valve and crankcase breather on auxiliary-air device.

Retest all fuel and air connections for tight seat.

Start engine and test for intake of unmetered air.

yes

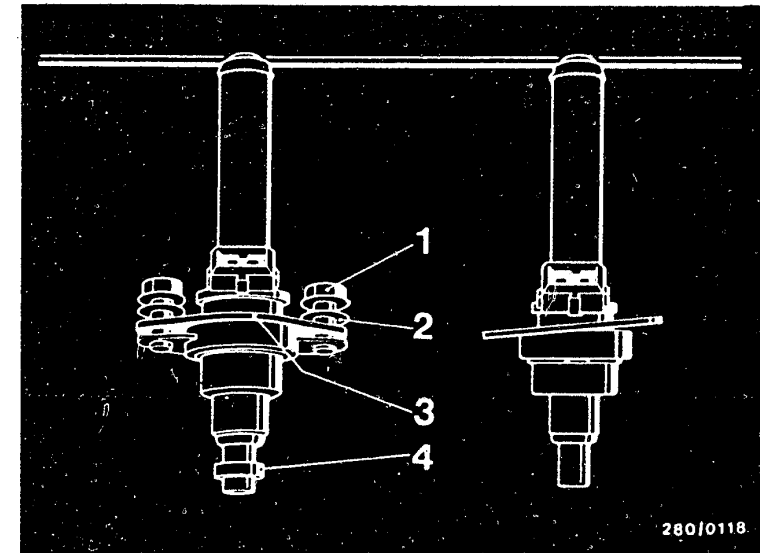
Continued on H19/H20



1 = Hose termination sleeve

(Similar construction for Lancia-Beta):

- 1 = Hexagon screw
- 2 = Washer
- 3 = Retainer
- 4 = Rubber ring



H17

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H18

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Fuel delivery O.K.?

no

Measuring the fuel delivery:

For testing, undo the junction between the fuel return hose (from pressure regulator) and fuel return line (to fuel tank). If necessary, extend hose and lead into a 5 l vessel with graduated scale.

Remove air hose to air filter on air-flow sensor. Ignition "ON". Open sensor flap by hand until electric fuel pump operates.

Set value: min. 675 cm³/30 s

Remedy if test specification not reached:

- Fuel filter clogged → Replace
- Voltage at fuel pump plugs, with engine running min. 12 V → Clean contacts; possibly also eliminate poor ground connection; replace leads
- Pressure regulator defective → Replace.
- Fuel pump delivery too low → Replace electric fuel pump.

Caution! After testing is completed, refit the hose between air filter and air-flow sensor.

yes

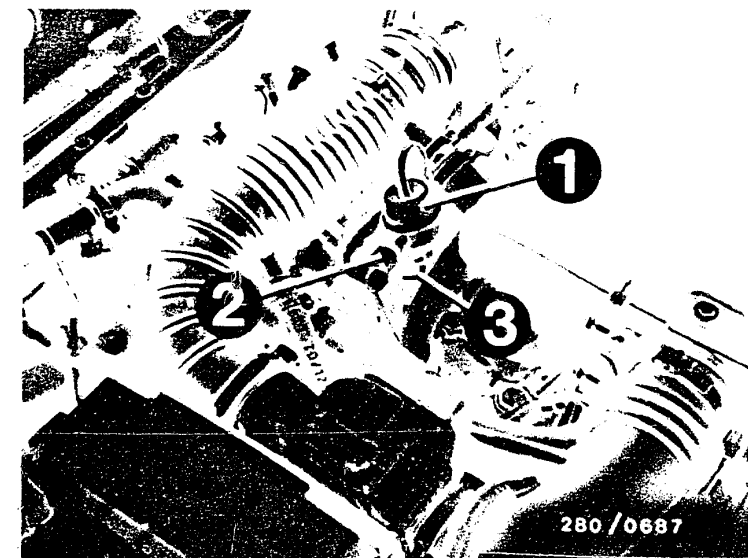
Control unit O.K.?

no

Let engine run. Shake control unit lightly and move multiple plug. Watch for engine missing. Repair plug-in connection on multiple plug or replace defective control unit.

yes

Continued on H21/H22



1 = Pressure regulator

2 = Fuel distribution pipe connection

3 = Fuel return hose

H19

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H20

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

Burbling on the overrun?
Throttle valve closed?
CO and idle adjustment O.K.?

no

1. Check the exhaust system for leaks.
2. Throttle valve closed? Check whether the throttle valve can be closed still further and whether the engine speed thereby drops.
3. Adjusting a throttle-valve switch:
(only in 0 280 120 300):

Loosen fastening screws slightly. Connect ohm-meter to term. 2 and term. 18. Turn throttle-valve switch to the right until the idle contact (micro-switch) can be heard to click (reading 0Ω).

Checking the adjustment:

Pull slightly on throttle cable. The idle contact must be heard to click (reading $\infty\Omega$).

Trouble-shooting: Test the following leads for continuity using ohmmeter (set value approx. 0Ω):

- From multiple plug term. 2 to throttle-valve switch term. 2.
- From throttle-valve switch term. 18 to multiple plug term. 18
- Eliminate contact resistances in plug connections.

4. Test overrun cutoff

(only for vehicles with control unit
0 280 000 216 from model 82):

Bring engine at normal operating temperature to 4000 min^{-1} . Bridge with insulated wire term. 2 and term. 18 in plug of throttle-valve switch.

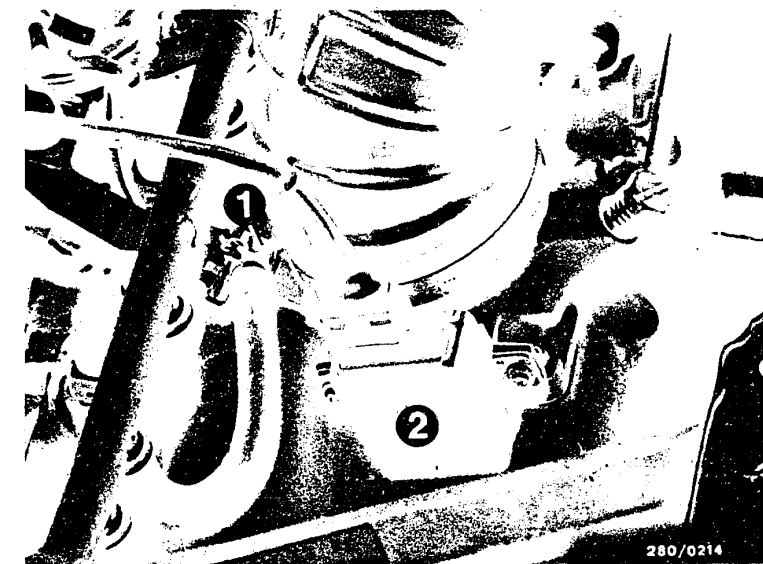
No injection pulses may be registered up to
 1200 min^{-1} .

The injection pulses must again be present below
approx. 1200 min^{-1} .

yes

Continued on J1/J2

Continued on H23/H24



Model 81

similar to model 82

2 = Throttle-valve switch

H21

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



H22

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



Engine missing under all operating conditions (continued)

yes

4.1 Testing the overrun cutoff with a motortester:

Connect the test lead as follows:

The two-pole plug connectors of the test lead are connected between an injection valve and its connecting lead.

Only one connection terminal of the two remaining connection terminals of the test lead must be connected to the special input of the motortester. Insulate free connection terminal (danger of short-circuit!).

The figure adjacent is visible on the oscilloscope in correct connection. Bring engine at normal operating temperature to 4500 min^{-1} .

Remove foot from accelerator until idle contact is closed.

No injection pulses should now be visible.

The injection pulses should be visible again from approx. 1200 min^{-1} .

5. CO and idle adjustment

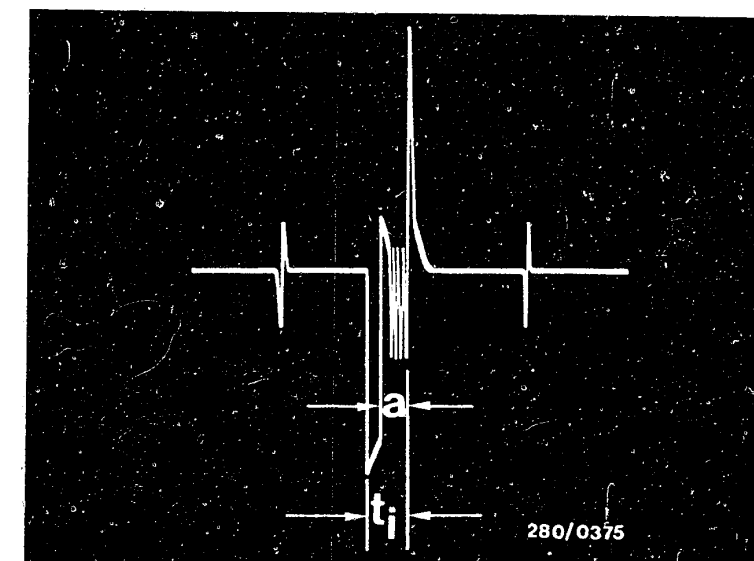
Exhaust-gas test with CO-tester with engine at normal operating temperature and idle speed.

Idle speed

Manually shifted, automatic transmission

(Lever in position N): $900 \dots 1000 \text{ min}^{-1}$

CO adjustment: $2.0 \dots 3.0 \% \text{ by vol. CO}$



Injection pulse of a current-regulator output stage (measured at the injection valve)

a = Pulse length

t_i = Injection pulse

At idle with no load on the engine "a" is not yet visible on the oscilloscope

1 = CO adjusting screw

2 = Idle-speed adjusting screw



Continued on J1/J2

H23

Engine missing under all op. conditions

Lancia Beta, Trevi, HPE, Coupé

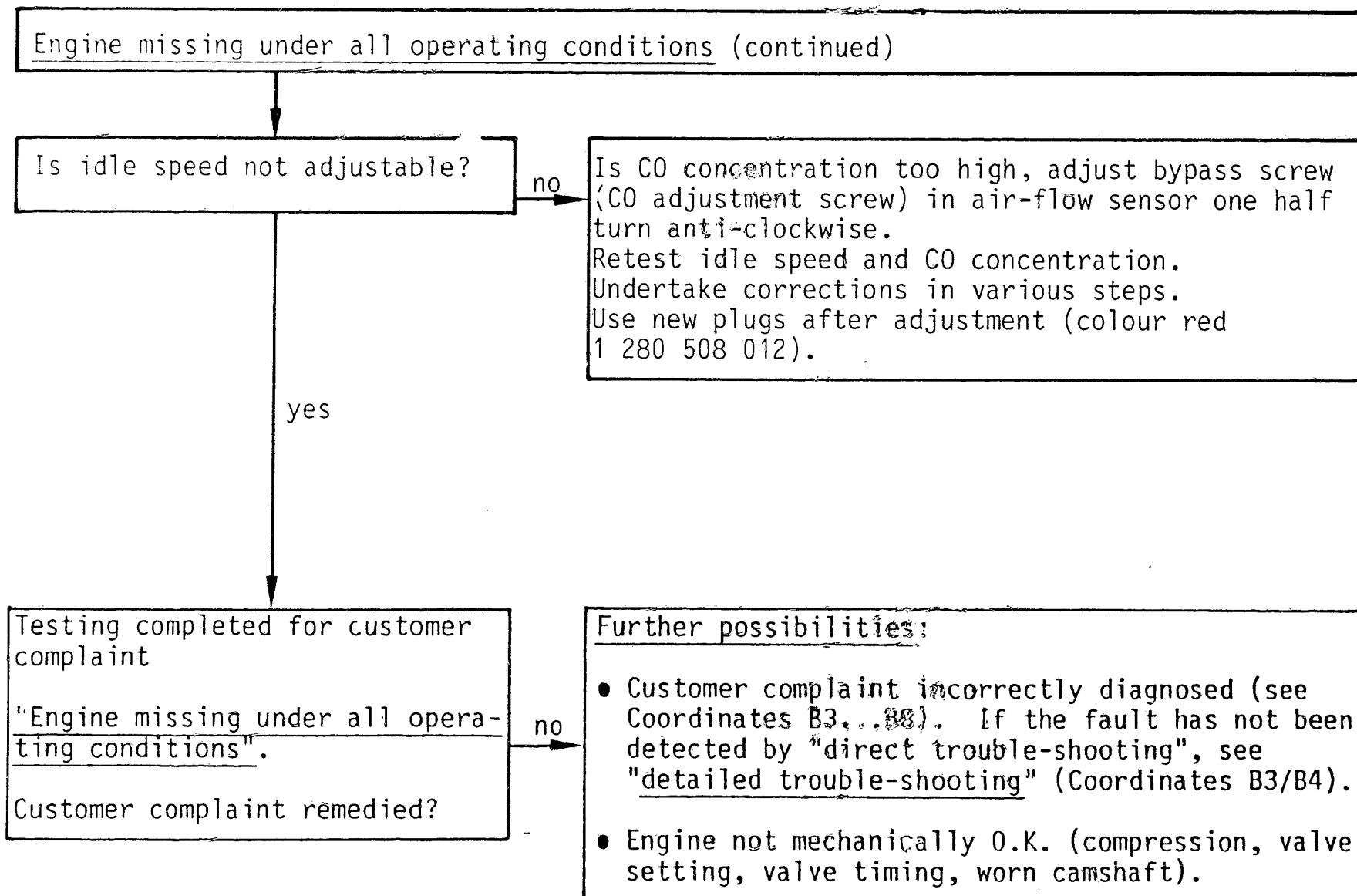


H24

Engine missing under all op. conditions

Lancia Beta, Trevi, HPE, Coupé





1 = CO adjusting screw
2 = Idle-speed adjusting screw

J1

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



J2

Engine missing under all op. conditions
Lancia Beta, Trevi, HPE, Coupé



FUEL CONSUMPTION TOO HIGH

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

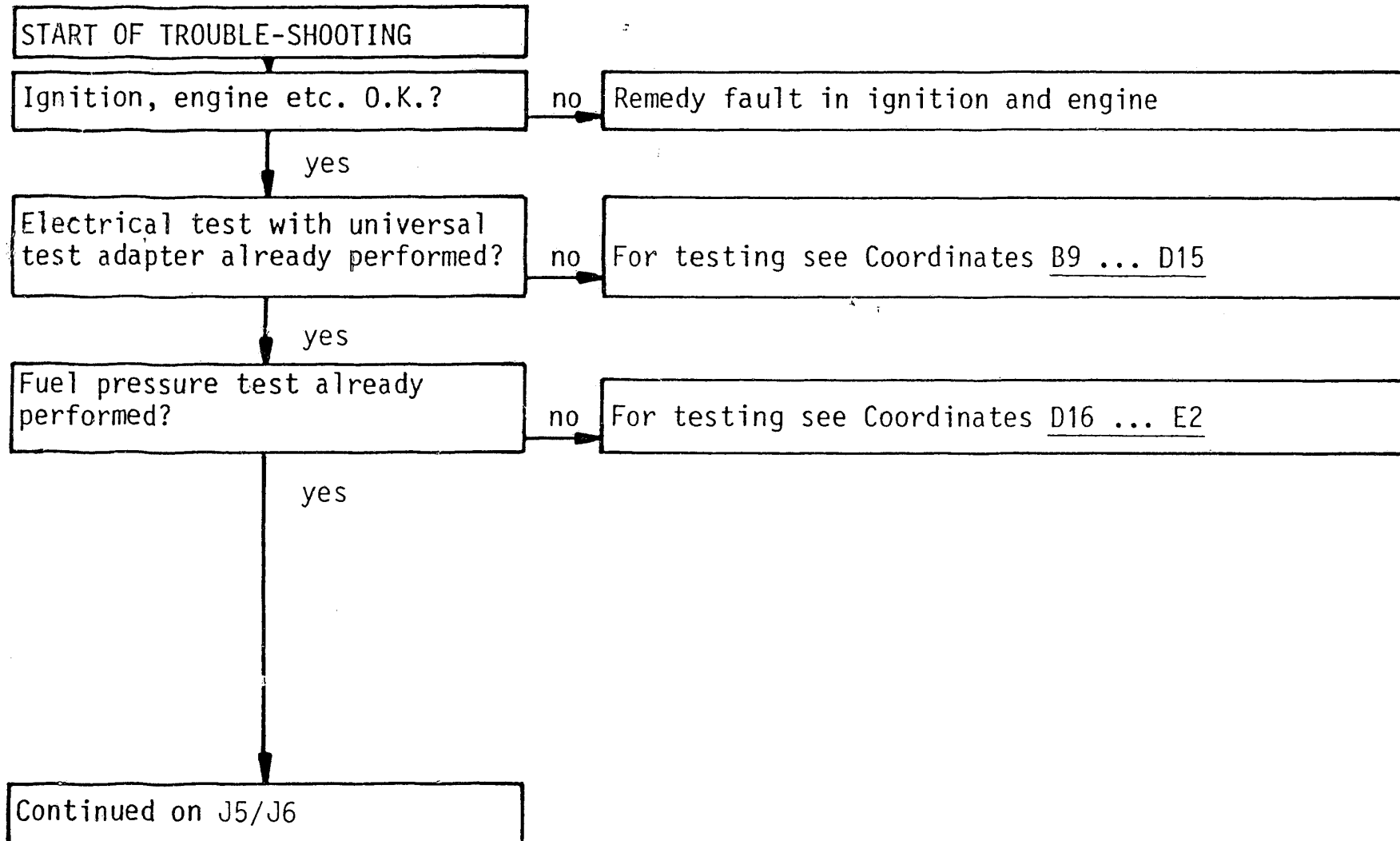
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



J3

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé

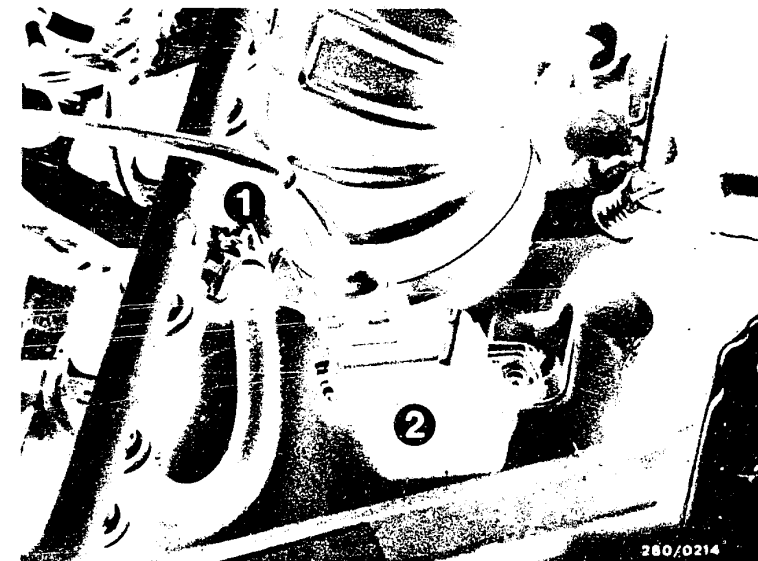
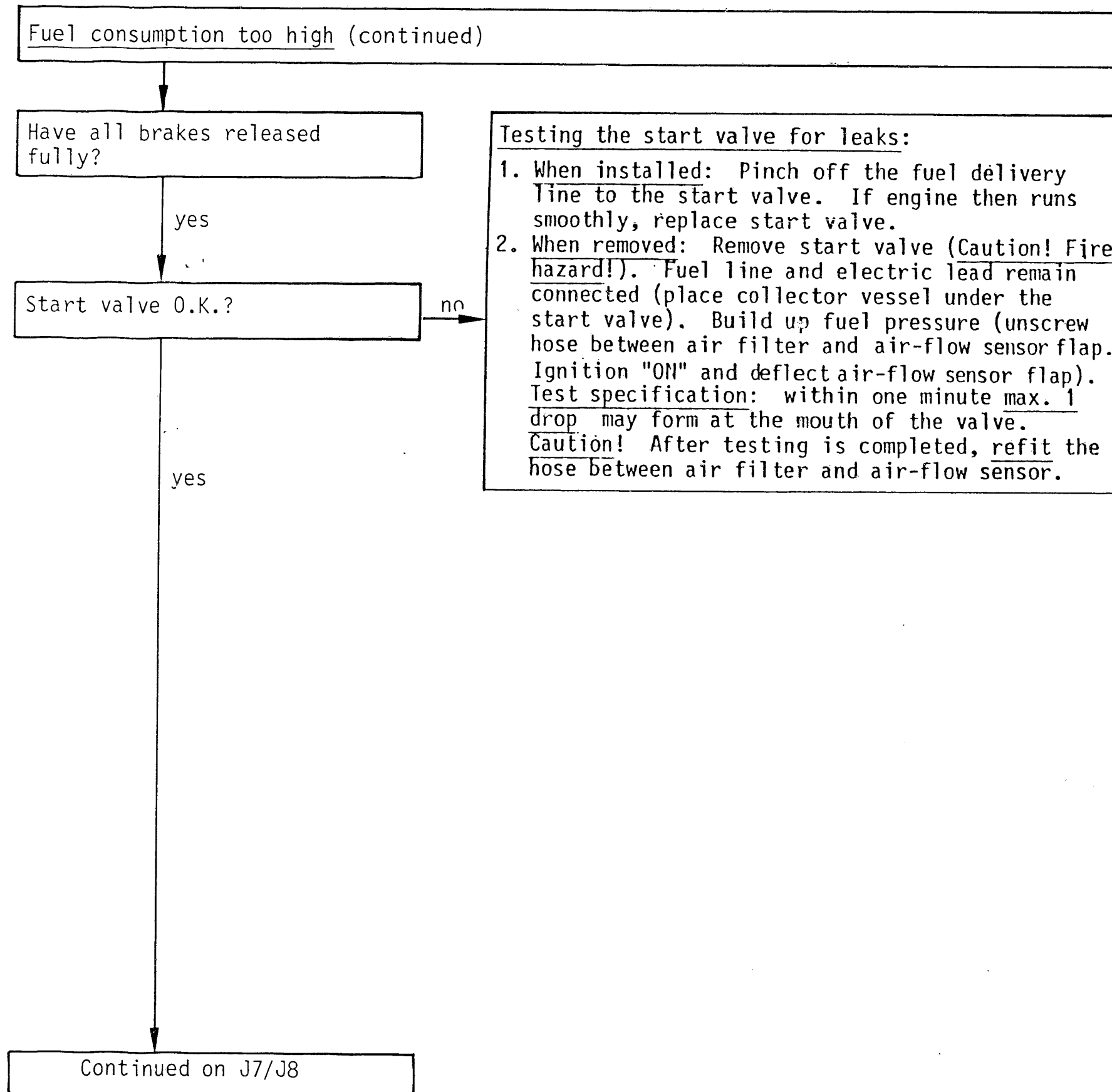


J4

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé





1 = Start valve
(blue plug)
2 = Throttle-valve switch

J5

Fuel consumption too high
Lancia Beta, Trevi, HPE, Coupé



J6

Fuel consumption too high
Lancia Beta, Trevi, HPE, Coupé



Fuel consumption too high (continued)

Temperature sensors tested?

no

Testing:

Temperature sensor I measures the intake air temperature and is located in the air duct of the air-flow sensor. Measure the following values between term. 27 and term. 6 of air-flow sensor:

1. At ambient temperature (approx. +15°C...+30°C):
1.45...3.3 k Ω
2. With engine at normal op. temp. (approx. +80°C):
280...360 Ω

Make direct resistance measurement at temperature sensor II (engine) using ohmmeter. Resistance measurement at term. 13 and term. 49 (ground):

1. At ambient temperature (approx. +15°C...+30°C):
1.30...3.6 k Ω
2. With engine at normal op. temp. (approx. +80°C):
250...390 Ω

If incorrect, check for open circuit or short circuit in the following leads using ohmmeter:

Temperature sensor I:

- From multiple plug term. 27 to air-flow sensor term. 27.
- From air-flow sensor term. 6 to multiple plug term. 6.

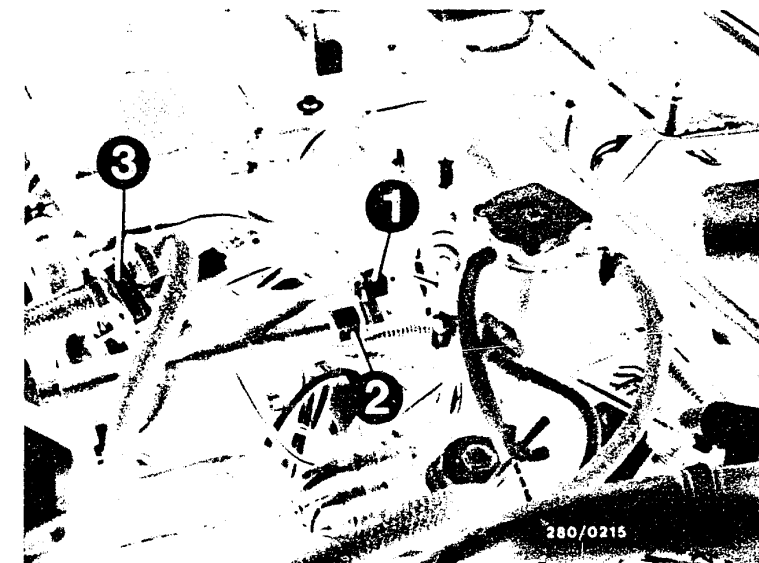
Temperature sensor II

- From multiple plug term. 13 to temperature sensor II term. 13.
- From temperature sensor II term. 49 to central ground (lead 49).

Test all contacts in plug connections.

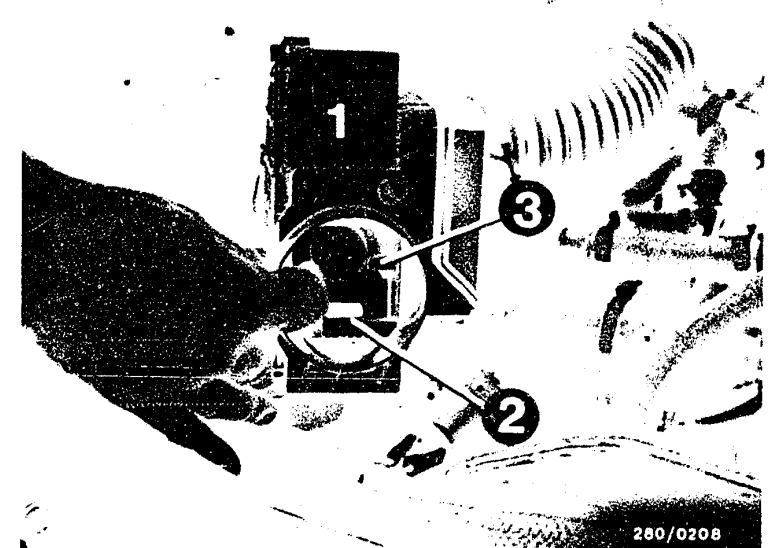
yes

Continued on J9/J10



- 1 = Temperature sensor II
- 2 = Thermo-time switch
- 3 = Auxiliary air device

- 1 = Air-flow sensor
- 2 = Stopper
- 3 = Temperature sensor I in air-flow sensor (intake passage)



J7

Fuel consumption too high
Lancia Beta, Trevi, HPE, Coupé



J8

Fuel consumption too high
Lancia Beta, Trevi, HPE, Coupé



Fuel consumption too high (Continued)

Injection valves mechanically O.K.?

no

With the engine running, detach injection-valve connectors individually, one after the other, from the injection valves and plug on again. Engine speed must drop if injection valve O.K. Test for continuity in connecting leads from relay set term. 88b, term. 88e via the injection valves to control unit term. 14, 15, 32 and 33. If necessary, replace leads or injection valves.

yes

Air-flow sensor O.K.?

no

The air-flow sensor is fastened to battery mounting with three screws.

Testing:

Unscrew pipe piece between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance.

Deflect air-flow sensor flap.

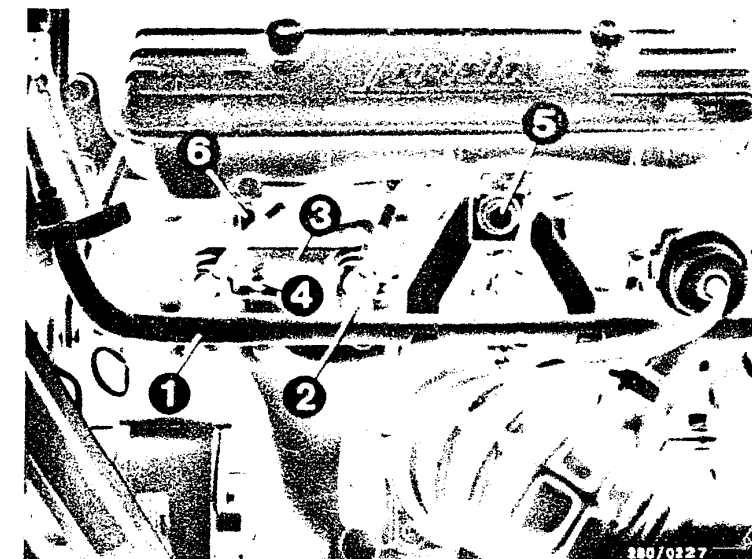
Test specification: 200 ... 1000 Ω

Caution!

After testing is completed, refit pipe-piece between air filter and air-flow sensor.

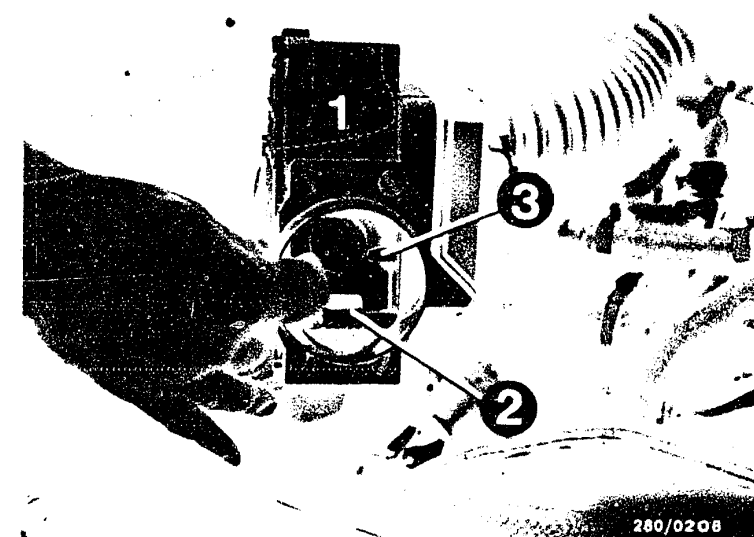
yes

Continued on J11/J12



2 = Solenoid-operated injection valves

1 = Air-flow sensor



J9

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé



J10

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé



Fuel consumption too high (continued)

CO and idle speed correctly adjusted?

no

CO and idle adjustment: Exhaust-gas test with CO analyzer with engine at normal operating temperature and at idle speed.

Idle speed

Manually-shifted transmission, automatic transmission (selector lever in position N):

900 ... 1000 min⁻¹

CO setting:

2.0 ... 3.0 % vol. CO

Is CO concentration too high, adjust bypass screw (CO adjustment screw) in air-flow sensor one half turn anti-clockwise (from FD 248 with AF 5 hexagon screwdriver). Retest speed and CO concentration. Undertake corrections in various steps. Use new plugs after adjustment (1 280 508 012 red).

yes

Can engine speed not be adjusted?

yes

Testing completed for customer complaint

"Fuel consumption too high"

Customer complaint remedied?

no

Further possibilities:

- Customer complaint incorrectly diagnosed (see Coordinates B3...B8). If the fault has not been detected by "direct trouble-shooting", see "detailed trouble-shooting" (Coordinates B3/B4).
- Engine not mechanically O.K. (compression, valve setting, valve timing, worn camshaft).



1 = CO adjusting screw

2 = Idle-speed adjusting screw

J11

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé



J12

Fuel consumption too high

Lancia Beta, Trevi, HPE, Coupé



MAXIMUM ENGINE POWER/TOP SPEED NOT REACHED

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

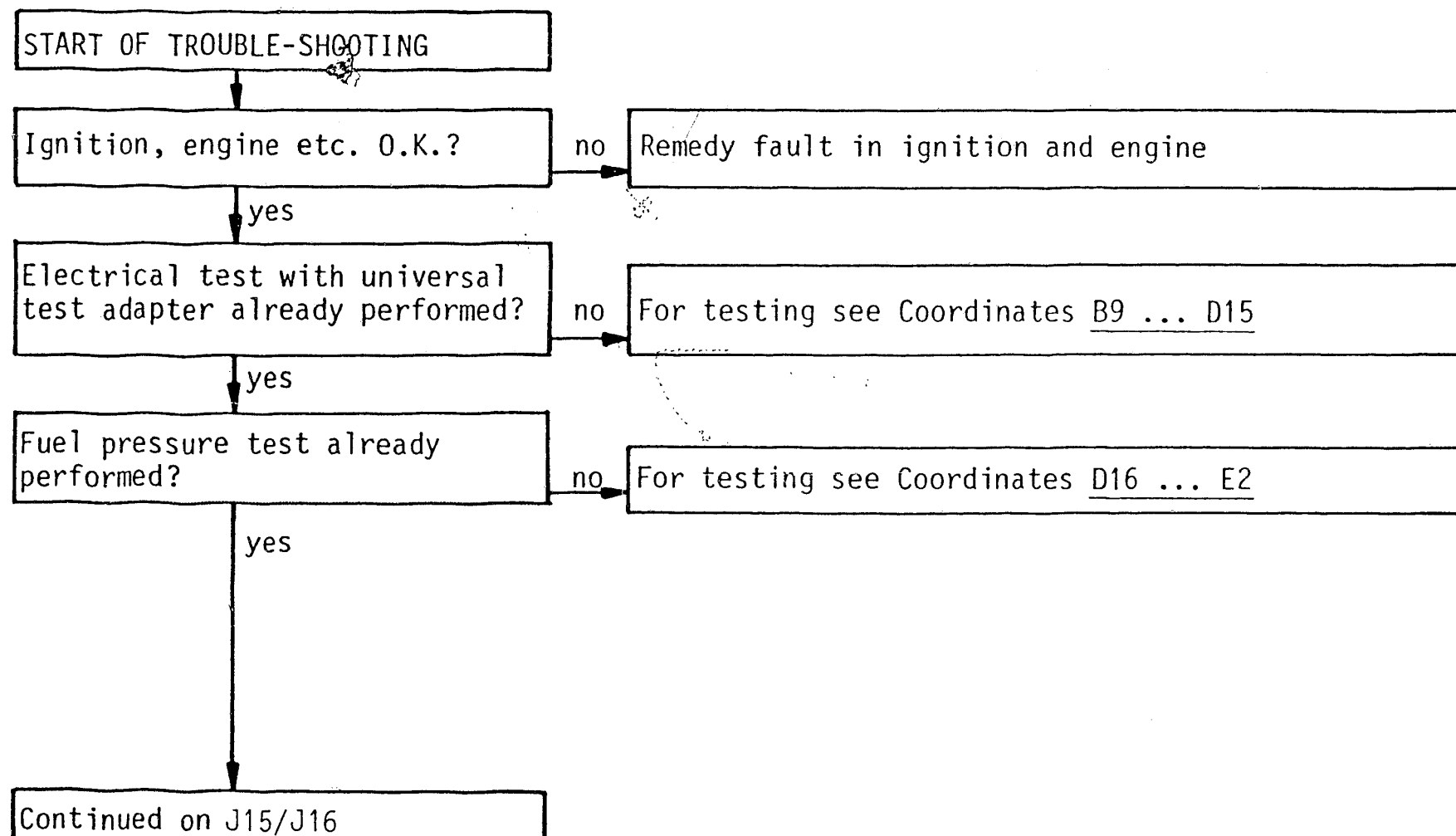
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.

**J13**

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé

**J14**

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



No maximum engine power, top speed not reached (continued)

Does throttle valve open fully?

no

Throttle linkage, accelerator pedal O.K.?
Straighten linkage if necessary. Throttle linkage may stick due to floor mat etc.
Check plug-in connection on throttle-valve switch and control unit.

Testing:

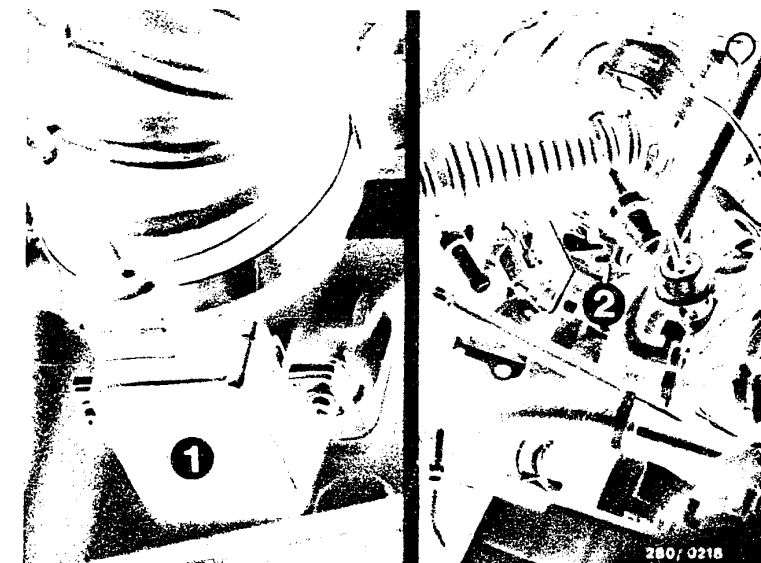
Open the throttle valve fully. (Completely depress accelerator). Connect ohmmeter to term. 3 and term. 18 on throttle-valve switch (set value: approx. 0 Ω).

If reading differs, replace throttle-valve switch. If the fault is still not remedied, check the following leads for continuity using ohmmeter (set value 0 Ω):

From throttle-valve switch term. 3 to control unit term. 3. From throttle-valve switch term. 18 to control unit term. 18.

yes

Continued on J17/J18



1 = Throttle-valve switch
2 = Fastening screws

J15

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



J16

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



No maximum engine power, top speed not reached (continued)

Throttle-valve switch O.K.?
(Full-load enrichment)

Control unit faulty?

no

Connect test lead as follows:

The two-pole plug-in connections of the test lead are connected between an injection valve and its connecting lead.

Of the other two terminals of the test lead, only one terminal must be connected to the special input of the motortester.

Caution:

The other terminal must not be brought into contact with vehicle ground.

If the correct terminal is connected, the oscilloscope pattern shown opposite is visible. With the aid of the test lead it is possible to test the injection pulses at the injection valves with an ignition oscilloscope with the engine running.

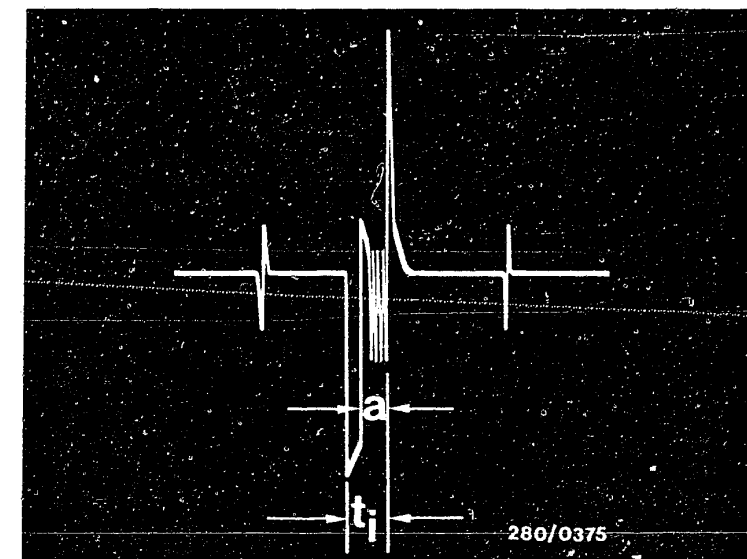
Observe the injection pulses at idle. Remove the throttle-valve switch plug and bridge term. 3 and term. 18 (using insulated wire).

Caution!

Do not bend terminals. Injection pulse must become longer. If not: Test connecting leads from multiple plug to throttle-valve switch (term. 3 and term. 18) for continuity. If O.K., replace control unit.

yes

Continued on J19/J20



Injection pulse of a current-regulated output stage (measured at the injection valve)

a = Pulse length

t_i = Injection pulse

At idle with no load on engine the current regulation a is not yet visible on the oscilloscope.

J17

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



J18

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



No maximum engine power, top speed not reached (continued)

Fuel delivery O.K.?

no

Measuring the fuel delivery:

For testing, undo the junction between the fuel return hose (from pressure regulator) and fuel return line (to fuel tank). If necessary, extend hose and lead into a 5 l vessel with graduated scale.

Remove air hose to air filter on air-flow sensor. Ignition "ON". Open sensor flap by hand until electric fuel pump operates.

Set value: _____ min. 675 cm³/30 s

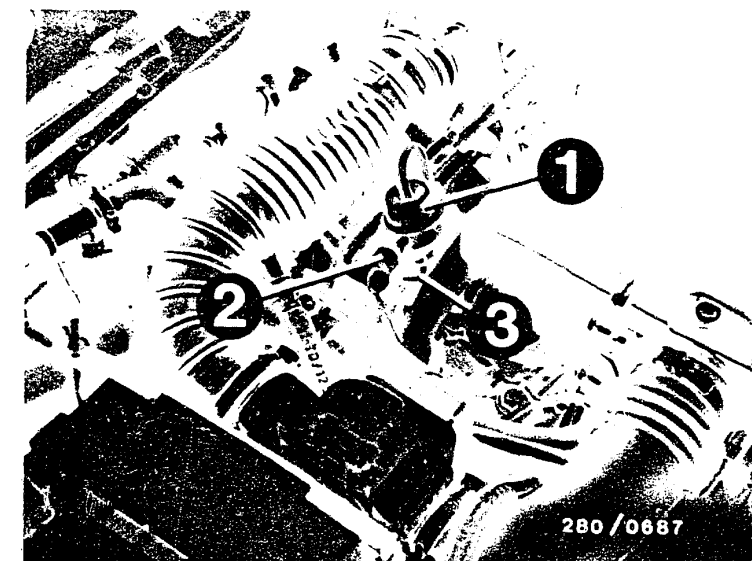
Remedy if test specification not reached:

- Fuel filter clogged → Replace
- Voltage at fuel pump plugs, with engine running min. 12 V → Clean contacts; possibly also eliminate poor ground connection; replace leads
- Pressure regulator defective → Replace.
- Fuel pump delivery too low → Replace electric fuel pump.

Caution! After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on J21/J22



- 1 = Pressure regulator
2 = Fuel distribution pipe connection
3 = Fuel return hose

J19

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



J20

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé



No maximum engine power, top speed not reached (continued)

Air-flow sensor O.K.?

no

The air-flow sensor is fastened to battery mounting with three screws.

Testing

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

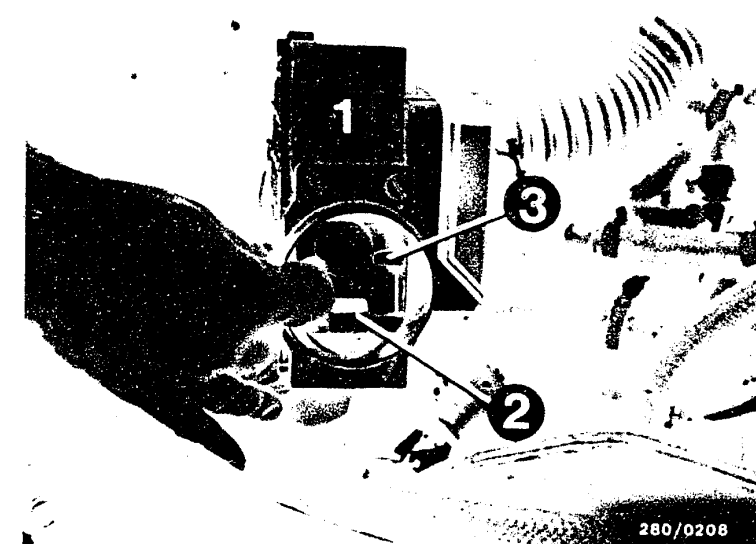
Test specification: $200 \dots 1000 \Omega$

Caution!

After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on J23/J24



1 = Air-flow sensor

J21

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé

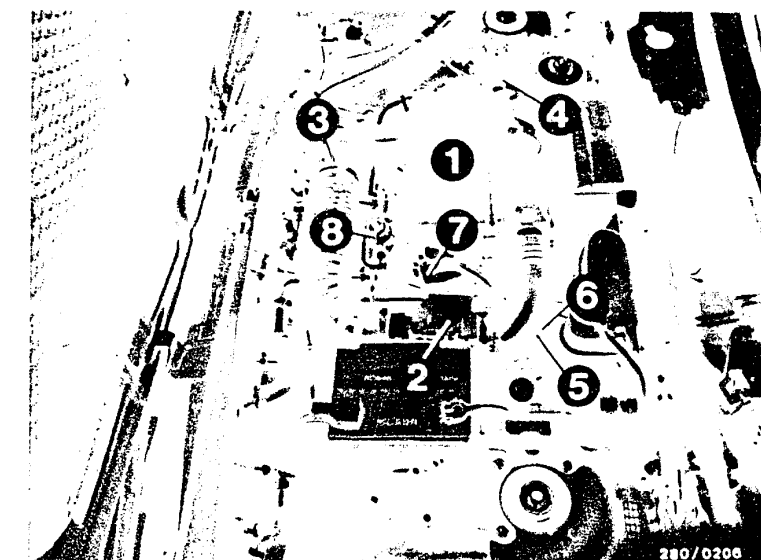
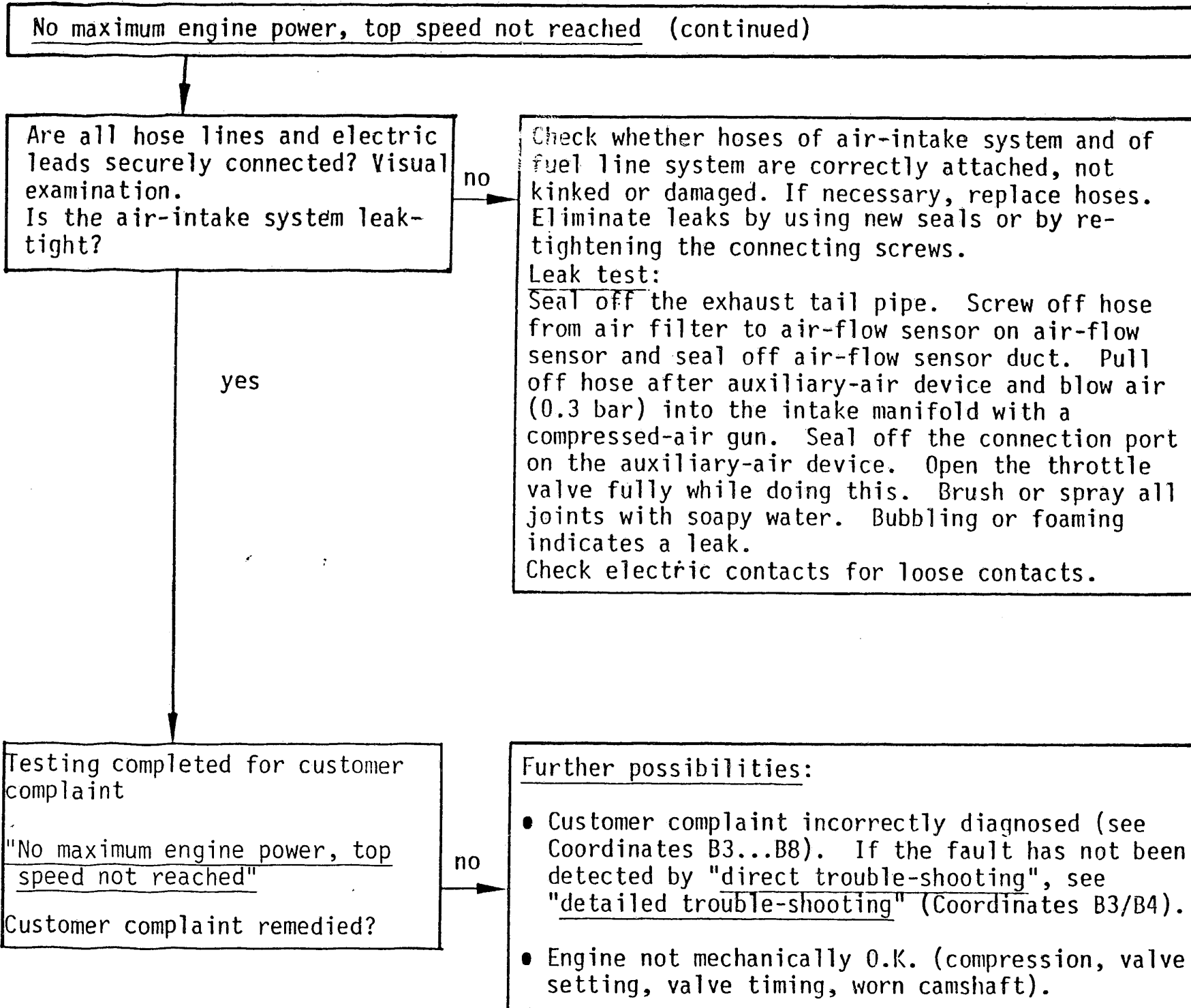


J22

No maximum engine power

Lancia Beta, Trevi, HPE, Coupé





- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Relay set
- 5 = Thermo-time switch (brown plug)
- 6 = Temperature sensor II (engine) (white plug)
- 7 = Auxiliary-air device (black plug)
- 8 = Pressure regulator

J23

No maximum engine power
Lancia Beta, Trevi, HPE, Coupé



J24

No maximum engine power
Lancia Beta, Trevi, HPE, Coupé



IDLE SPEED AND CO CONCENTRATION TOO LOW OR TOO HIGH

Trouble-shooting program according to customer complaints

How to use the following trouble-shooting program

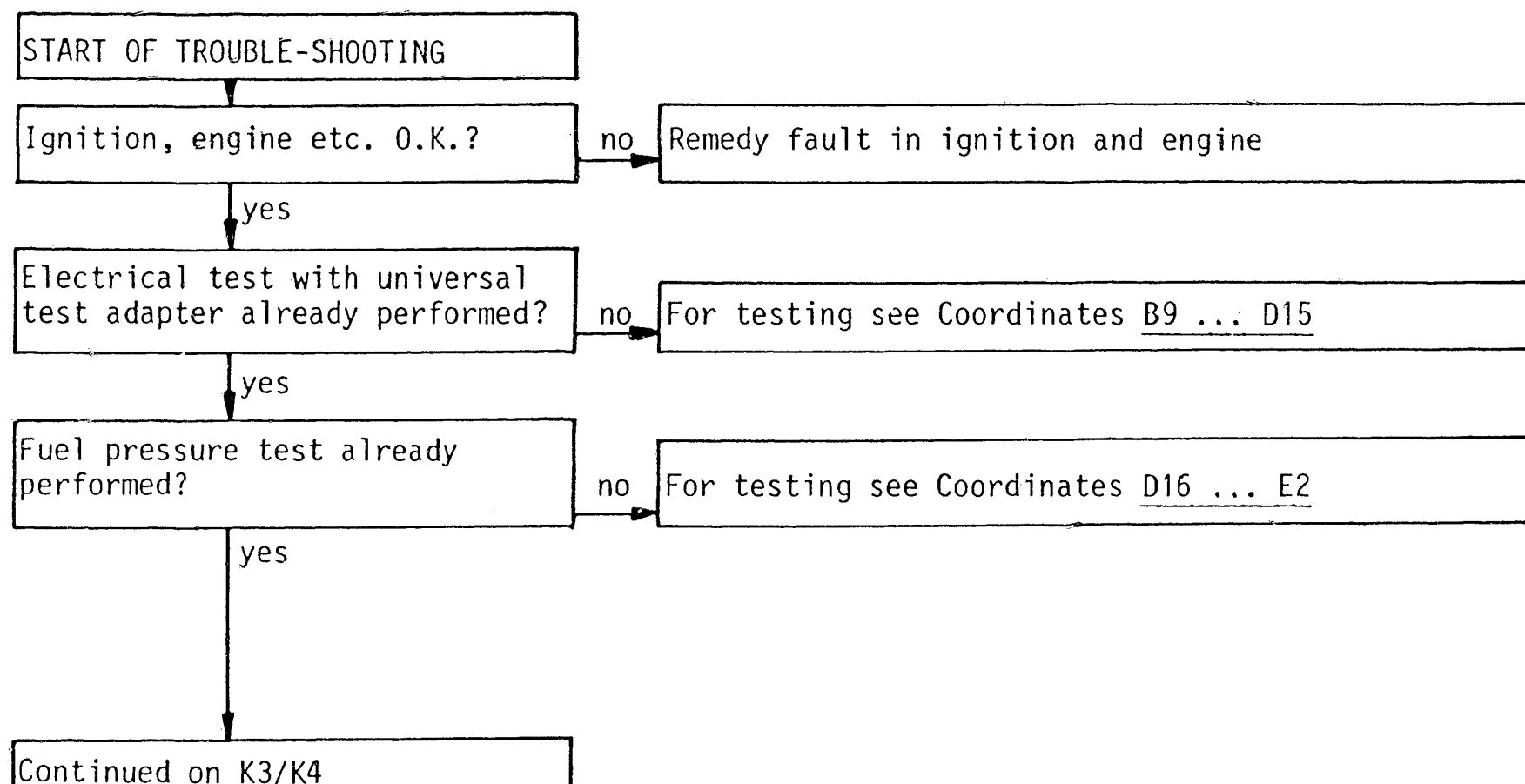
The program is divided into three rows of boxes:

- The left-hand row contains the questions on the tests.
- The middle row contains descriptions of the testing and adjustment operations on the components.
- The right-hand row contains the illustrations belonging to the text and explains the illustrations.

If the questions can be answered conclusively with "yes" without testing, proceed to the next question below.

If, on the other hand, the answer to the question is "no", and you suspect a fault, branch to the middle row of boxes and carry out the tests given there.

When you have finished testing continue trouble-shooting at the point at which you branched off.



K1

CO adjustment

Lancia Beta, Trevi, HPE, Coupé

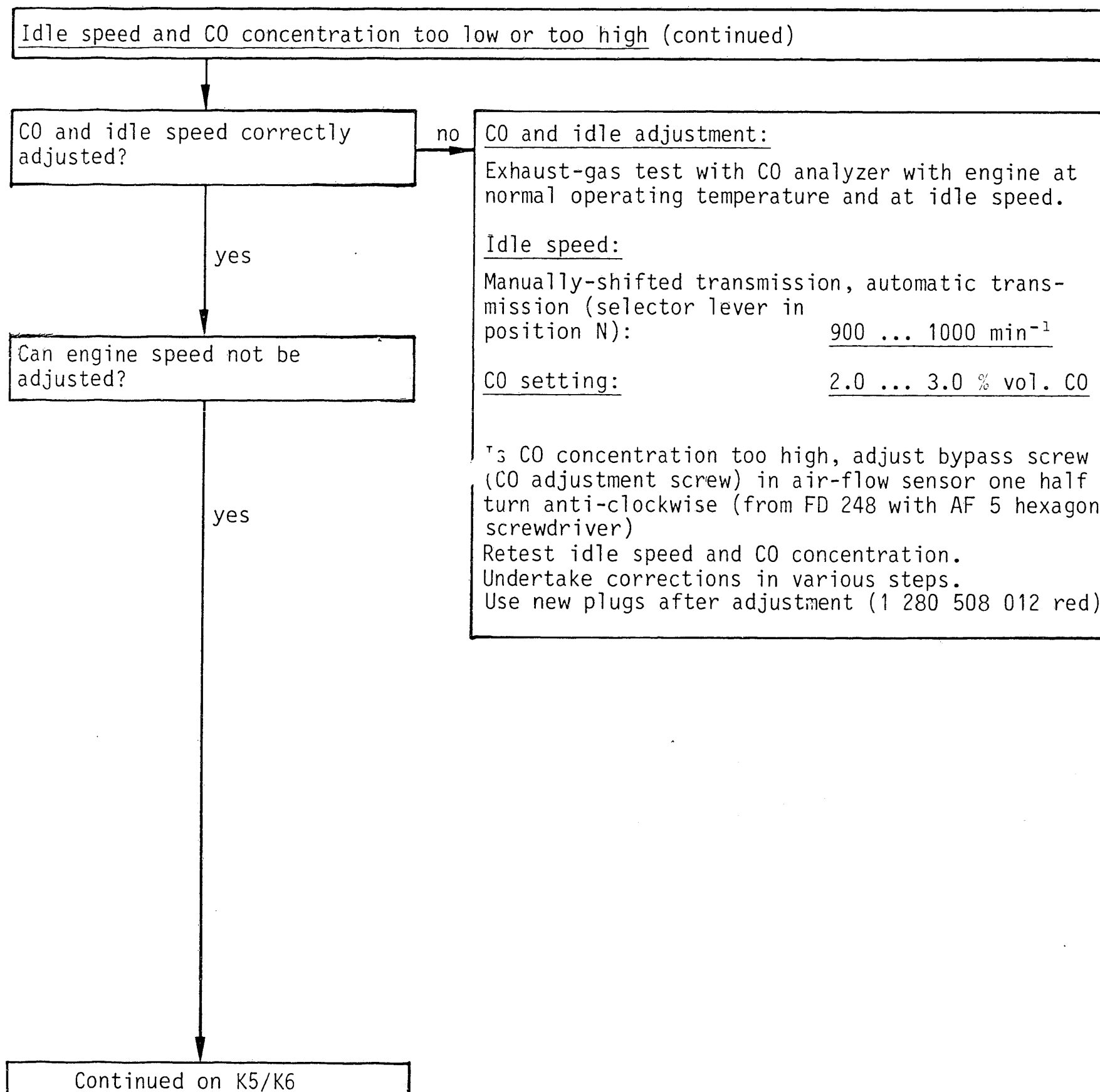


K2

CO adjustment

Lancia Beta, Trevi, HPE, Coupé





K3

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



K4

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



CO adjustment at idle too low or too high (continued)

Air-flow sensor O.K. ?

no

The air-flow sensor is fastened to battery mounting with three screws.

Testing:

Unscrew hose between air filter and air-flow sensor. Open air-flow sensor flap by hand. It must be possible to open the air-flow sensor flap with uniform ease from its fully closed position to its fully open position. When released, the flap must close completely by itself. When the air-flow sensor flap is opened it must not catch at any point. Watch for any indications of abrasion or rubbing. Clean air-flow sensor if the inside is very dirty and rub out with a lint-free cloth. If there are any signs of abrasion or rubbing, replace the air-flow sensor. Connect ohmmeter to term. 7 and term. 8 of air-flow sensor. Measure resistance. Deflect air-flow sensor flap.

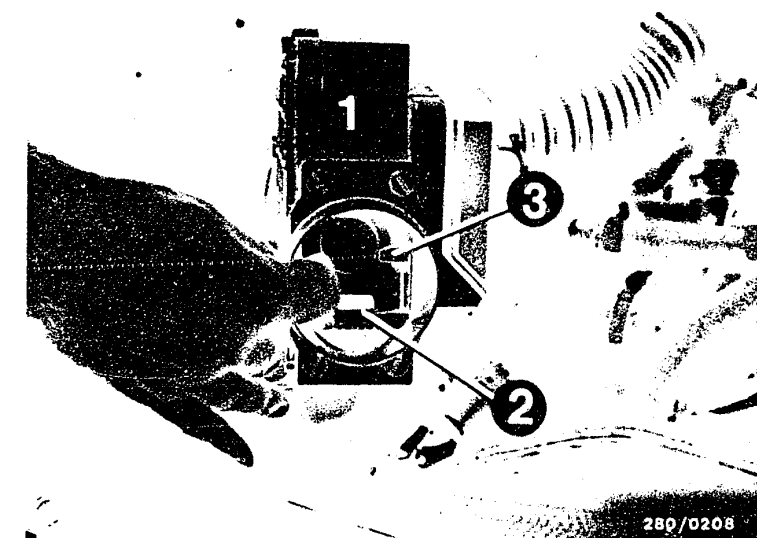
Test specification: 200 ... 1000 Ω

Caution!

After testing is completed, refit the hose between air filter and air-flow sensor.

yes

Continued on K7/K8



- 1 = Air-flow sensor
- 2 = Stopper
- 3 = Temperature sensor I

K5

CO adjustment

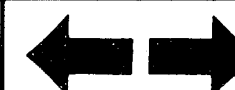
Lancia Beta, Trevi, HPE, Coupé



K6

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



CO adjustment at idle too low or too high (continued)

CO concentration below tolerance?

max. 3.0 % by vol. CO

Temperature sensors O.K.?
Start valve leak-tight?

no

Testing the temperature sensor:

Using ohmmeter, make direct resistance measurement at temperature sensor II (engine). Resistance measurement at term. 13 and term. 49 (ground):

1. Ambient temperature (approx. + 15°C...+30°C) 1.30 ... 3.6 kΩ
2. Engine at normal op. temp. (approx. +80°C): 250 ... 390 Ω

If incorrect, check for open circuit or short circuit in following leads using ohmmeter:

- Multiple plug term. 13 to temperature sensor II term. 13.
- Temperature sensor II term. 49 to central ground (lead 49).
- Check all contacts in the plug-in connections.

Testing the start valve:

Testing the start valve for leaks:

1. When installed

Pinch off the fuel delivery line to the start valve. If engine then runs smoothly, replace start valve.

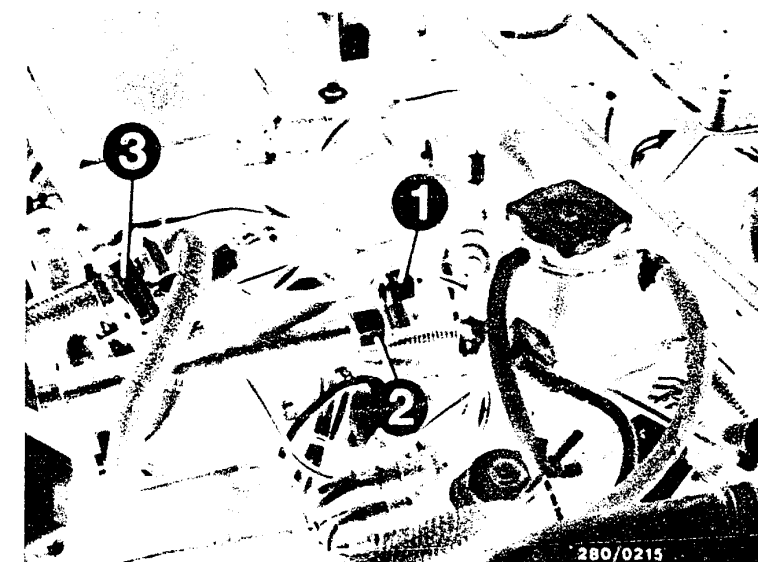
2. When removed

Remove start valve (Caution! Fire Hazard!). Fuel line and electric lead remain connected (place collector vessel under the start valve). Build up fuel pressure (remove hose between air filter and air-flow sensor. Ignition "ON" and deflect air-flow sensor flap).

yes

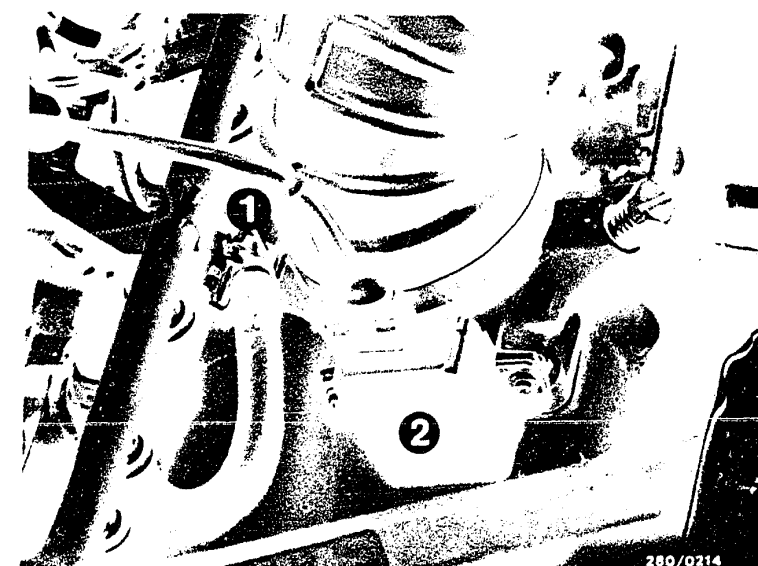
Continued on K11/K12

Continued on K9/K10



- 1 = Temperature sensor II (engine)(white plug)
2 = Thermo-time switch
3 = Auxiliary air device

- 1 = Start valve
2 = Throttle-valve switch



K7

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



K8

CO adjustment

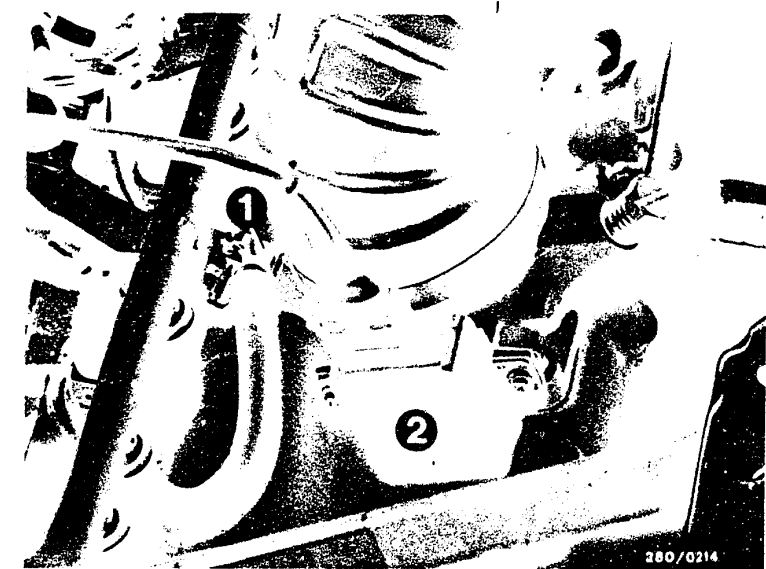
Lancia Beta, Trevi, HPE, Coupé



CO adjustment at idle too low or too high (continued)

Test specification:
Within one minute max. 1 drop may form at the mouth
of the valve.

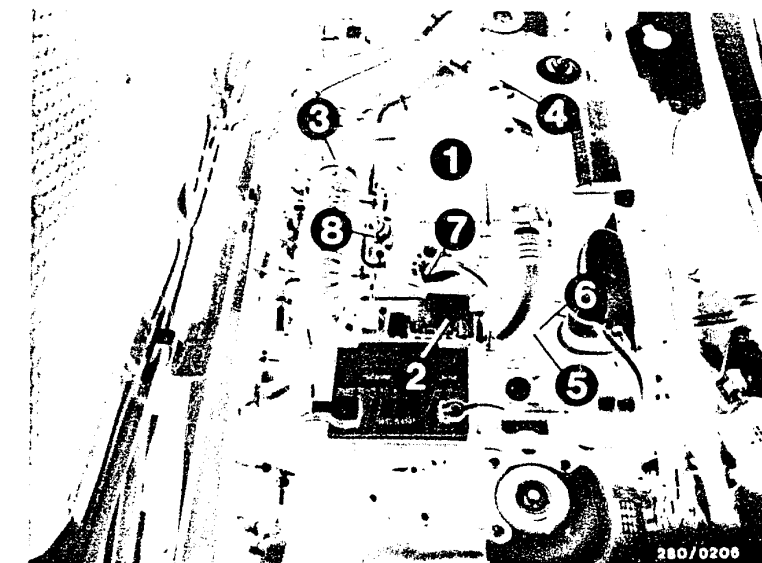
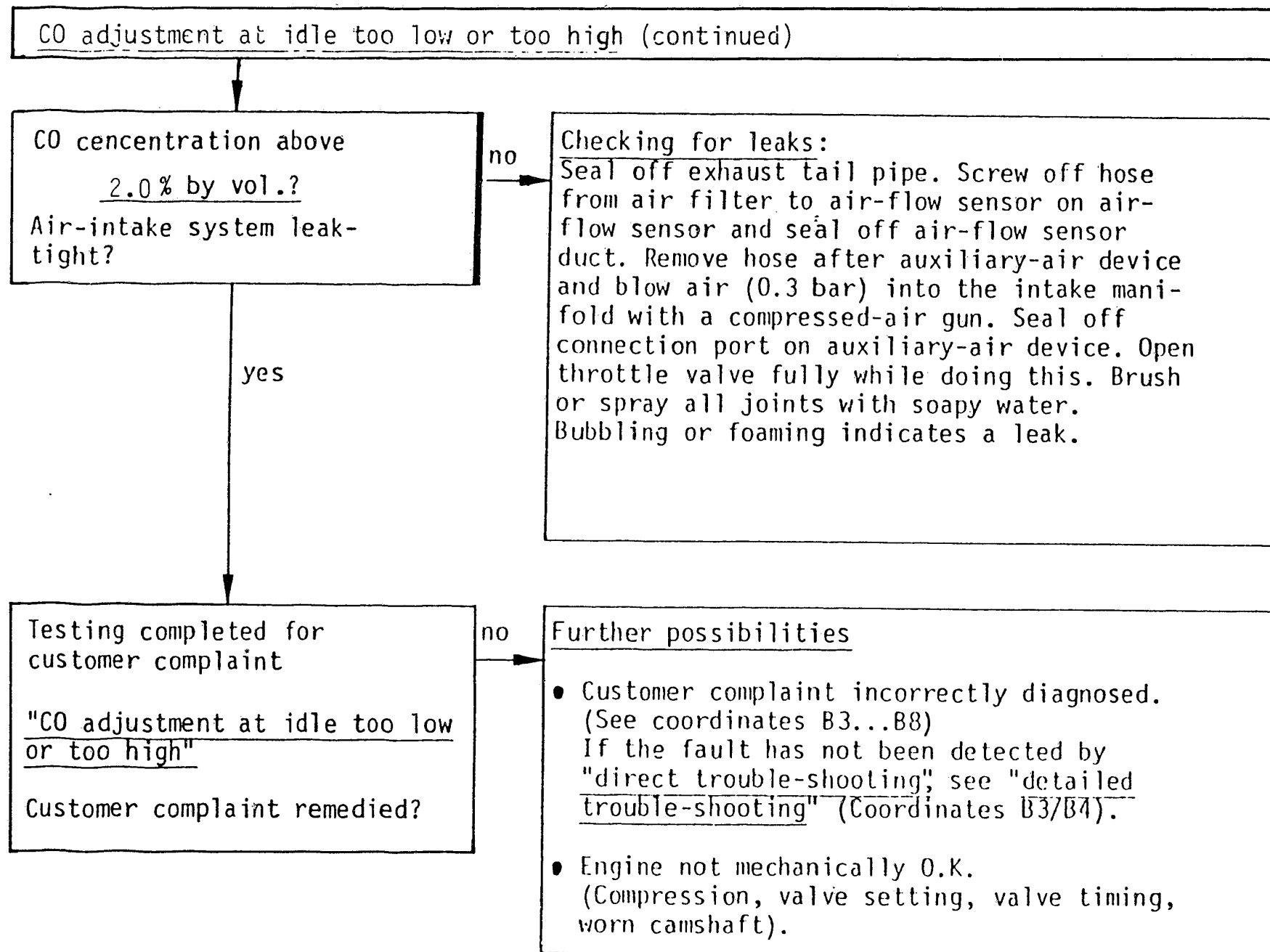
Caution!
After testing in completed, refit the hose between
air filter and air-flow sensor.



1 = Start valve
2 = Throttle-valve switch

yes

Continued on K11/K12



- 1 = Air filter
- 2 = Air-flow sensor
- 3 = Throttle-valve switch
- 4 = Relay set
- 5 = Thermo-time switch
(brown plug)
- 6 = Temperature sensor II
(engine)
(white plug)
- 7 = Auxiliary-air device
(black plug)
- 8 = Pressure regulator

K11

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



K12

CO adjustment

Lancia Beta, Trevi, HPE, Coupé



After-sales Service

Motor Vehicle Service Information

Only for use within the Bosch organization. Not to be communicated to any third party.

UNIVERSAL TEST ADAPTER

VDT-I-Gen. 1001 En

1.1982

1. Application

The multiplicity of different fuel-injection and ignition systems at present available on the market, as well as the advances in development which can be expected in the future, demand a new testing concept. In order to maintain the outlay for test equipment, and hence the costs, at a reasonable limit we have developed the universal test adapter.

The following systems can be tested using a test-adapter universal unit together with adapter leads suited to the system in question:

1.1 Systems which are already being fitted as series:

- 0 L-Jetronic (1st generation)
- 0 LE-Jetronic (2nd-generation L-Jetronic)
- 0 Motronic (with the new connector designation, refer to the vehicle-specific instructions!)

1.2 Systems whose introduction is planned:

- 0 Motronic with gearbox control
- 0 KE-Jetronic
- 0 Mono-Jetronic
- 0 Electronic ignition system with ignition map (EZF)

2. Delivery dates and Part Numbers

Available as from 2.1982.

2.1 Universal test adapter (basic unit)

Part Number: 0 684 101 801

Designation: ETT 018.01

2.2 System adapter lead for LE-Jetronic (2nd-generation L-Jetronic)

Part Number 1 684 463 123

First application: For BMW 2.5/2.8 l engines as from 9.1981, and for Opel 2.0 l engines (Manta/Rekord) as from 9.1981.

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Motor Vehicle service information

Lancia Beta, Trevi, HPE, Coupé



2.3 System adapter lead for Motronic with new connector assignment.

(Refer to the vehicle-related instructions!)

Part Number : 1 684 463 124

First application: Porsche 944 as from series production, BMW as from about 3.1982 (Europe)

2.4 System adapter lead for L-Jetronic (in preparation)

Further system adapter leads will be made available along with the introduction of the new systems as mentioned above.

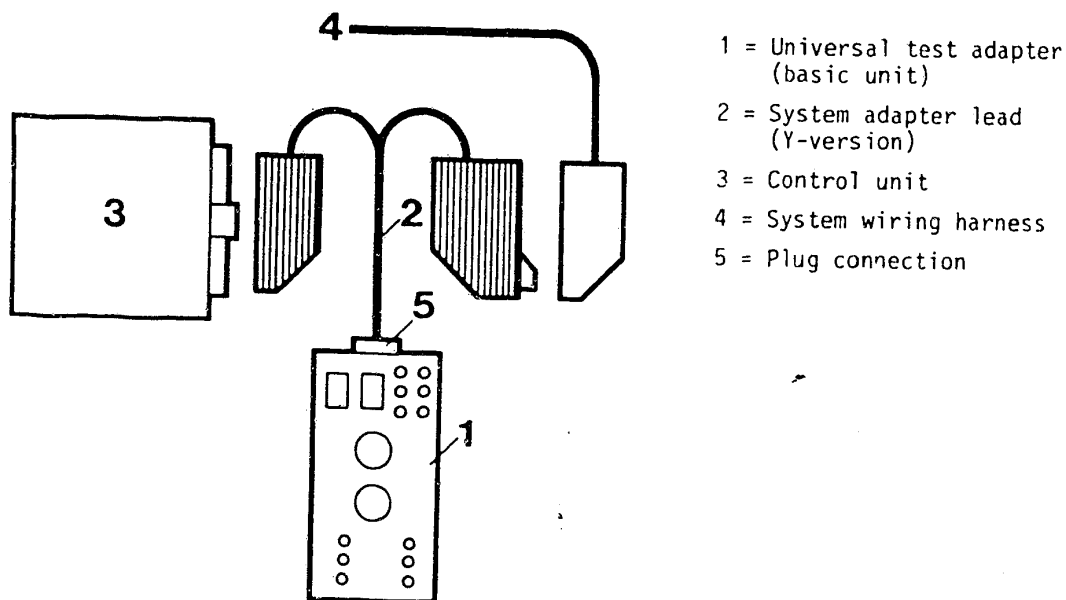
3. Testing procedure

The systems and the components are tested for voltage and resistance values as well as for correct functioning. Evaluation is by means of a multimeter and the Motortester which are connected into the universal test adapter.

Depending upon the complexity of the system, interchangeable adapter lead model 1 or model 2 is provided:

3.1 Adapter lead for peripheral and function testing (Model 1)

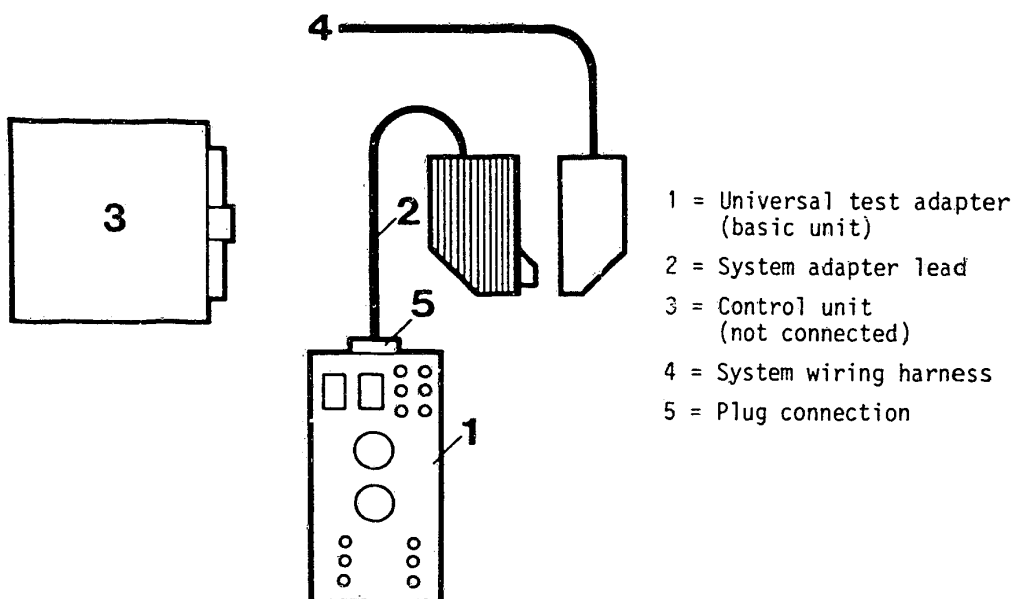
The universal test adapter together with the system adapter lead is to be connected to the system wiring harness and to the control unit (e.g. Motronic).
To be tested: Wiring harness with components and control unit.



3.2 Adapter lead for peripheral testing (Model 2)

The universal test adapter with system adapter lead, is only to be connected to the system wiring harness (e.g. LE-Jetronic (2nd-generation L-Jetronic)).

To be tested: Wiring harness with components (without control unit).

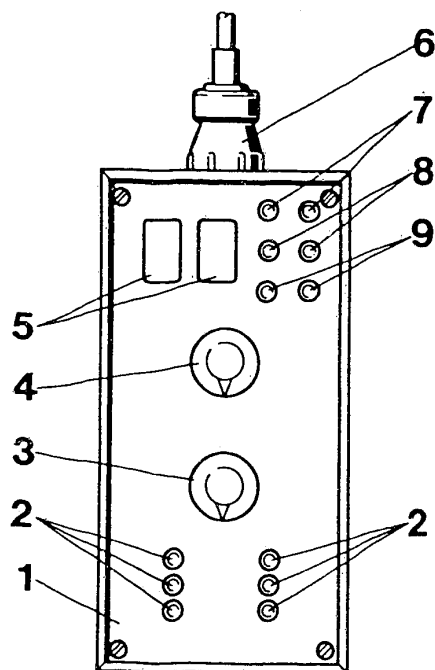


4. Construction of the universal test adapters

The universal test adapter is fitted with 2 program switches footage and resistance measurement. The measured values are displayed on the multimeter connected to the universal test adapter. For reasons of safety, the voltage and resistance sockets are separated. In order to measure signals (e.g. injection pulses, ignition pulses), it is necessary to connect a Motortester to the measuring cavities (special input).

When carrying out functional tests with the control unit connected, selected push-buttons are pressed in a number of test-program steps in order to simulate a variety of different engine operating conditions the influence of which is evaluated using the Motortester.





- 1 = Universal test adapter (basic unit)
- 2 = Keyboard for simulation of various conditions e.g. engine temperature, throttle position etc.
- 3 = Program switch "Ohm" for resistance measurement
- 4 = Program switch "Volt" for voltage measurement
- 5 = Measurement "cavities" (for the special input from the Motortester)
- 6 = 63-pole plug-in connection for connecting the system adapter lead
- 7 = Measurement sockets (voltage measurement with a multimeter or with the Motortester)
- 8 = Measurement sockets (resistance measurement with the multimeter)
- 9 = Sockets for special functions (not yet allocated)

Notes:

1. The Motronic test adapter (0 684 101 800, ETT 018.00) will continue to be used for Motronic-equipped BMW vehicles (with old connector assignment) up to about year of manufacture 3.1982 (refer to vehicle-specific instructions).
2. Details on the operation of the universal test adapter, and the test specs, are to be found in the vehicle-specific after-sales service instructions.

3. Caution! Change of Part Number:

On the SIS-microfiches OPE-00/J22 (Coordinates A14 and A17) the new Part Numbers are as follows:

Universal test adapter: 0 684 101 801

Adapter lead : 1 684 463 123



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HOT-STARTING PROBLEMS

VDT-I-Gen. 050 En

on vehicles fitted with Jetronic

9.1982

Customer complaints

If the vehicle is parked and the engine switched off after having been run at normal operating temperature, it often occurs that the engine proves difficult to start, or won't start at all, and when it does start it runs extremely roughly (only on 2 or 3 cylinders). The engine has to be accelerated a number of times before it runs smoothly.

Causes

For economic reasons ("stretching" of the mineral-oil reserves), it can happen that alcohol in varying quantities has been added to gasoline. Methanol is used for instance.

Such alcohol-added fuels, depending upon the amount of alcohol, adversely affect the hot-starting characteristics of the engine. The addition of alcohol raises the vapor pressure of the fuel and the result is that the boiling point of the alcohol-fuel mixture drops. This in turn leads to the formation of fuel-vapor locks in the fuel system when the engine has been switched off.

This means that when starting, and during the subsequent idle period, the air-fuel mixture is temporarily too lean.

Remedies

- Check the ignition and Jetronic systems, particularly for leaks.
- Changing to another brand of gasoline can sometimes cure the problem immediately.
- In many cases, fully depressing the gas pedal helps during starting, as does slightly depressing the gas pedal during the idle period until the engine runs smoothly.
- Fit the pulse relay 0 340 000 003 (refer also to VDT-I-438/105) in vehicles with K and D-Jetronic.
This step, though, will still not fully alleviate the rough running of the engine during the starting off phase

Note:

The pulse relay 0 340 000 003 is NOT to be installed in vehicles fitted with L-Jetronic.

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LIQUID PETROLEUM GAS (AUTOGAS) SYSTEMS AND
VEHICLES WITH K-JETRONIC

VDT-I-Gen. 052 En
10.1982

Fitting at a later stage

Vehicles with K or L-Jetronic are not suitable for fitting at a later stage with liquid petroleum gas (LPG) systems.

Numerous problems can occur, such as:

- Reduction of fuel flow through the injection valves due to deposits
- Stiffness or blocking of the K-Jetronic fuel distributor plunger (due to gumming or similar) in the course of time with "gas only operation."
- Increased danger of backfiring in the intake manifold (burbling) and thereby damage to the air-flow sensor.

Guarantee

Guarantee claims for failed Jetronic components from vehicles thus converted will not be accepted.

Conversion to liquid gas operation is made at the risk of the vehicle owner.

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After-sales Service

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Parts Cleaning

Use of highly-inflammable cleaning agents, or cleaning agents which are dangerous to health

Gen.

VDT-I-Gen./18 En
7.1978

When cleaning parts which come from vehicle electrical products prior to repair, it is permitted to use the following cleaning agents: Benzine, trichloethylene (tri) and perchloroethylene (per). These are dangerous, and must be handled with appropriate care. The relevant safety regulations in West Germany are:

Regulations concerning work with inflammable liquids (VbF) issued by the Federal Labor Ministry (BmA).

Safety regulations for the use of chlorinated hydrocarbons
as applied to the works ZH1/222
as applied to personnel ZH1/119

as issued by the Federation of the Trade co-operative Associations
(Central Association for Accident Prevention and Industrial Medicine)
Langartweg 103, D-5300 Bonn 5).

1. Benzine, acetone and ethanol (ethyl alcohol) are inflammable liquids and their mixtures with air are dangerous due to the risk of explosion. Parts washing may only take place in tanks or containers solely intended for this purpose and equipped with a "melt" safety device for the lid which, in case the liquid catches fire, causes the lid to close automatically and smother the fire. In the case of larger containers (exceeding 500 x 500mm) some form of suction extraction must be provided.
- 1.1 Generators, alternators, wiper motors, small-power motors and other electrical equipment for installation in vehicles are, in ever increasing numbers, being equipped with capacitors having long storage times (e.g. for interference-suppression purposes in radio-receiver or transmitter installations).

When washing such parts, it is possible that a capacitor discharge can occur when the part is immersed in the cleaning agent. This can lead to an inflammable liquid catching fire. For this reason, parts on which a capacitor is fitted are only to be washed in trichloethylene (tri) or perchloroethylene (per).

- 1.2 In the case of starting motors, it has already been pointed out in earlier repair instructions that the parts should be thoroughly dried after washing in benzine, this applies particularly to windings. With sliding-gear starting motors, the first test run after washing out must be performed without the closure cap in order to avoid the possibility of explosion.

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2. Trichlorethylene (tri) and perchloroethylene (per) are both liquids whose vapors have a stupefying effect, and which are dangerous to health if inhaled over long periods. Tri vapor is heavier than air, and therefore especially dangerous at floor level. Gloves and goggles are to be worn when washing out parts in these liquids.

If cleaning of parts is carried out regularly, or continuously, in trichlorethylene only containers or tanks intended solely for this purpose are to be used, and the suction extraction device is to be switched on. When washing parts do not bend over the container.



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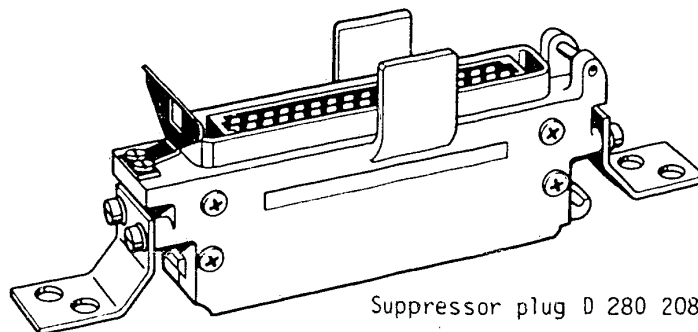
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PERMANENTLY INSTALLED AND PORTABLE TRANSMITTER
INSTALLATIONS FITTED IN VEHICLES EQUIPPED WITH
L-JETRONIC

VDT-I-280/106 En
4.1981

If, in vehicles equipped with L-Jetronic and in which transmitter installations are operated, whether permanently installed or removable and portable, malfunctions occur whilst the vehicle is being driven (the engine shakes or stops etc.), the following measures can be taken to remedy these faults:

- The hinges for the engine hood and the luggage-compartment lid are to be bridged with a flexible copper braided grounding strip (efficient grounding!).
- The antenna base is to be connected to the vehicle chassis using a copper grounding strip to ensure clean, 100% connection.
- Locate the transmitter and its antenna as far away as possible from the L-Jetronic control unit.
- Tune the transmitter to the antenna in order to achieve the minimum reflection coefficient.
- The parallel routing of the cables for the transmitter power supply and the antenna with the L-Jetronic wiring harness is to be avoided (danger of cross-coupling and cross-talk).



Suppressor plug D 280 208 091

If the disturbances and complaints continue even though the above measures have been taken, then the degree of suppression can be improved by incorporating the suppression plug D 280 208 091 between the wiring-harness plug and the L-Jetronic control unit.

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Ordering

REGE/AV is to order direct from KH/VKD2.

Price

Available upon request.

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DETERMINATION OF THE TEMPERATURE VALUES
GIVEN IN L-JETRONIC MANUALS

VDT-I-280/108 En
5.1982

We have recently been asked with increasing regularity how accurately the engine temperature must be measured when trouble-shooting on the vehicle.

So far in its L-Jetronic manuals KH/VSK has given three or four different temperatures for testing the temperature sensor:

-10 °C, +20 °C, +40 °C and +80 °C,

and two ranges for the thermo-time switch e.g. 35 °C 8 sec.

below +30 °C and above +40 °C.

Since the temperature range need not be subject to such close tolerances, we propose in future the following more appropriate definition:

- Ambient temperature (approx. +15 °C to +30 °C)
- Engine at normal operating temperature (approx. +80 °C).

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PLUG-AND-SOCKET CONNECTORS FOR JETRONIC COMPONENTS

Parts sets

VDT-I-280/111 En

11.1982

(Replaces Ed. 7.82)

Parts sets are available for replacement Jetronic plug-and-socket connectors.
The parts sets comprise:

- Connector housing
- Protective cap (rubber sleeve)
- Contact springs

These parts sets are listed on microfiche EE...*.

* See microfiche EE00 under 0 280 ..

- Plug, black, 2-pin, parts set 1 287 013 002 cable connector in conjunction with socket, 2-pin

- Socket, black, 2-pin, parts set 1 287 013 001 for e.g.:

Temperature sensor	0 280 130 0..
Auxiliary-air device	0 280 140 ..
Thermo-time switch	0 280 130 2..
Start valve	0 280 170 ..
Warm-up regulator	0 438 140 ..

- Socket, grey, 2-pin, parts set 1 287 013 003 for:

Solenoid-operated injection valve 0 280 150 ..

- Socket, black, 3-pin, parts set 1 237 000 039 for:

Throttle-valve switch 0 280 120 ..

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- Socket, black, 5-pin, parts set 1 287 013 066 for
Air-flow sensor 0 280 20. ... (LE-Jetronic)
- Socket, black, 6-pin, parts set 1 287 013 004 for
Air-flow sensor 0 280 200 ...
- Socket, black, 7-pin, parts set 1 287 013 005 for
Air-flow sensor 0 280 20. ...
Air-flow sensor 0 280 211 ...

The contact springs (minitimer) can also be supplied separately under Part No. 1 284 477 026.

The connector housings are only available in the stated colours.

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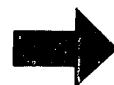


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